BOX-PC

IPC-BX/M560(PCW)

User's Manual

CONTEC

Copyright

Copyright 1999 CONTEC Co., LTD. ALL RIGHTS RESERVED

No part of this document may be copied or reproduced in any form by any means without prior written consent of CONTEC Co., LTD.

CONTEC Co., LTD. makes no commitment to update or keep current the information contained in this document. The information in this document is subject to change without notice.

All relevant issues have been considered in the preparation of this document. Should you notice an omission or any questionable item in this document, please feel free to notify CONTEC Co., LTD.

Regardless of the foregoing statement, CONTEC assumes no responsibility for any errors that may appear in this document nor for results obtained by the user as a result of using this product.

Trademarks

Award is trademark of Award Software Inc. Other brand and product names are trademarks of their respective holder.

FCC NOTICE

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

CAUTIO Connection between peripherals of the computer equipment must be made with low voltage shielded computer data cables.

WARNIN A single shielded power cord must be used to connect AC power to the unit.

Handling Precautions

Be sure to read the following precautions before using your BOX-PC so that you may use it trouble free for many years to come:

- Do not use or store the equipment where it is exposed to extremely high or low temperature or to an abrupt change in temperature.
  Examples: - Under direct sunlight
  - Near a heat source
- Do not use or store the equipment in a highly humid or dusty place. It is very dangerous to use the equipment with water, liquid, or conductive dust left inside. If the equipment must be used in such an unfavorable environment, install it in a dusttight structure such as a dust-proof control panel.
- Do not use or store the equipment where it is subject to shock or vibration.
- Do not use the equipment near a device generating a strong magnetic field or noise, or the field or noise may cause the equipment to malfunction.
- Do not use or store the equipment where it is exposed to any chemical directly or as vapor in the air.
- The heat sink on top of the equipment may heat up to cause a burn. Do not touch the heat sink directly when the equipment is on or immediately after turning the power supply off. Avoid installing the equipment where one can inadvertently touch the heat sink.
- To clean the equipment, wipe it carefully with a soft cloth damped with water or a solution of neutral detergent. Keep in mind that using a volatile solvent, such as benzine or thinner, or a chemical can cause the coating to peel or discolor.
- For continuous operation with a hard disk drive (HDD), be sure to use the HDD in standby mode. Using the HDD not in standby mode for continuous operation considerably shortens the lifespan.
  (For details, refer to the warning document attached to the optional product (2.5inch HDD).
- Be sure to unplug the power cable before mounting or demounting an expansion board (on Model EP) or before connecting or disconnecting a cable to any connector.
- CONTEC bears absolutely no responsibility for the equipment which has been modified.
- If you find any fault or abnormal symptom (such as an unusual smell or overheat), unplug the power cable first and consult your local retailer or the CONTEC.
- Use an AC cable which conforms to the rated supply voltage and wall outlet to be used. (The attached cable is for 125VAC.)

- Life Expectancy of Constituent Parts
  - Power supply
    Assuming continuous use at 25°C, the expected life of the power supply is approximately 60,000 hours. This may be lower given use at higher temperatures.
  - Battery
    A lithium primary battery is used to back up the internal calendar time and CMOS RAM. The backup time when the power supply is turned off is more than 10 years at 25°C.

  * The replacement of consumables is handled as a repair (charges will be assessed)

Table of Contents

Copyright i
Trademarks i
FCC NOTICE i
Handling Precautions ii

1. Introduction 1

Features 1
Limited One-Year Warranty 2
How to Obtain Service 2
Liability 2

2. Overview 3

Specifications 3
System Configuration and Options 5
System Configuration 5
Options List 6
Dimensions 7

3. Hardware Setup 9

Setup Overview 9
Setting up Hardware 10
Removing the top cover and the HDD bracket 10
Positions and Settings of Connectors and Jumpers .. 11
Installing the Hard Disk Drive 13
Installing Main Memory (DIMMs) 15
Installation Conditions 17

4. BIOS Setup 19

Setting up the BIOS 19
Invoking BIOS Setup 19
Key Operations 19
Main Menu 20
STANDARD CMOS SETUP 22
BIOS FEATURES SETUP 25

POWER MANAGEMENT SETUP 28
PNP/PCI CONFIGURATION 30
INTEGRATED PERIPHERALS 31
SUPERVISOR PASSWORD 33
USER PASSWORD 33

5. Functions of Components 35

Names of Controls 35
Keyboard Interface 37
Mouse Interface 37
Floppy Disk Interface 38
Serial Port Interface 40
CRT Interface 49
PCMCIA Slots (Model C and CP) 50
Printer Port Interface 52
RAS Features 53
Watchdog Timer 55
General-purpose Inputs/Outputs and Remote Reset 61
SW1 (General-purpose Switches for the User) 65
Reset Switch 65
ALARM LED 65
USB Ports 66
Ethernet (Models E and EP) 67
LCD Interface 68
IDE Interfaces 70
Expansion Slots (Model EP and CP) 72

6. Appendix 75

Memory Map 75
I/O Port Addresses 76
Interrupt Levels 77

List of Figures

Figure 2.1. System Configuration Diagram 5
Figure 2.2. IPC-BX/M560(PCW)E, C Dimensions 7
Figure 2.3. IPC-BX/M560(PCW)EP, CP Dimensions 8
Figure 3.1. Removing the Top Cover 10
Figure 3.2. Removing the HDD Bracket 10
Figure 3.3. Jumpers, Connectors, and Switches under the Top Cover 11
Figure 3.4. Mounting the HDD 14
Figure 3.5. Mounting the HDD (Side View) 14
Figure 3.6. Removing the Memory Cover 15
Figure 3.7. DIMM Attaching Method 16
Figure 3.8. DIMM Removing Method 16
Figure 3.9. Installation Orientations 17
Figure 3.10. Distances between the Main Unit and the Surroundings 18
Figure 4.1. Initial Screen 19
Figure 4.2. Main Menu Screen 20
Figure 4.3. STANDARD CMOS SETUP Screen 22
Figure 4.4. BIOS FEATURES SETUP Screen 25
Figure 4.5. POWER MANAGEMENT SETUP Screen 28
Figure 4.6. PNP/PCI CONFIGURATION Screen 30
Figure 4.7. INTEGRATED PERIPHERALS Screen 31
Figure 5.1. Names of Controls 35
Figure 5.2. Terminating Resistor Setting 42
Figure 5.3. Half-duplex Connection (JP19 1-2 Connection) 43

Figure 5.4. Full-duplex Connection (JP19 2-3 Connection)..... 43
Figure 5.5. Slot Numbers and Positions 50
Figure 5.6. Attaching a Card Stopper Bracket 50
Figure 5.7. sing the Watchdog Timer 56
Figure 5.8. WDT Control Port (0139h) 57
Figure 5.9. WDT Counter Port (013Ah)..... 57
Figure 5.10. Event Output Control Port (013Bh)..... 58
Figure 5.11. RAS Status Port (013Ch) 59
Figure 5.12. RAS Port Protect Port (013Ch) 59
Figure 5.13. Switch Data (013Dh) 60
Figure 5.14. Using General-purpose Inputs/Outputs and Remote Reset 62
Figure 5.15. General-purpose I/O Port (0138h)..... 62
Figure 5.16. Event Output Control Port (013Bh)..... 63
Figure 5.17. Port Protect Control Port (013Ch)..... 64
Figure 5.18. Input Circuit 64
Figure 5.19. Output Circuit..... 64
Figure 5.20. Data in General-purpose Switches for the User..... 65
Figure 5.21. SW1 Factory Settings 65
Figure 5.22. Dimensions of Expansion Board..... 72
Figure 5.23. Removing the Expansion Slot Cover..... 73
Figure 5.24. Installing an Expansion Board 74
Figure 6.1. Memory Map..... 75

List of Tables

Table 2.1. Function Specifications 3
Table 2.2. Installation Environment Conditions..... 4
Table 3.1. Jumpers..... 12
Table 3.2. Internal Connectors 12
Table 4.1. Key Functions 19
Table 5.1. Functions of Controls 36
Table 5.2. Keyboard Connector 37
Table 5.3. Mouse Connector..... 37
Table 5.4. FD Connector..... 38
Table 5.5. I/O Addresses and IRQs for SERIAL1/2 40
Table 5.6. Serial Port Connectors..... 40
Table 5.7. I/O Addresses and IRQ for SERIAL4 41
Table 5.8. Output Connector (RAS Connector) with RS-422/RS-485 Used..... 41
Table 5.9. I/O Addresses..... 44
Table 5.10. Register Functions <1/4>..... 45
Table 5.10. Register Functions <2/4>..... 46
Table 5.10. Register Functions <3/4>..... 47
Table 5.10. Register Functions <4/4>..... 48
Table 5.11. Baud Rate Settings..... 48
Table 5.12. CRT Connector 49
Table 5.13. Card Supplied Power..... 51
Table 5.14. Printer Port and I/O Addresses..... 52
Table 5.15. Printer Port Connector..... 52
Table 5.16. RAS Connector 53

Table 5.17. Changing the Port Addresses for RAS Features (SW1-3, SW1-4)..... 54
Table 5.18. Setting the Alarm-out Output State (SW1-1, SW1-2)..... 60
Table 5.19. USB Connectors..... 66
Table 5.20. Ethernet Connector..... 67
Table 5.21. Supported LCD List 68
Table 5.22. I/O Addresses and IRT for SERIAL3..... 69
Table 5.23. Primary IDE Connector (CN1) 70
Table 5.24. Secondary IDE Connector (CN2) 71
Table 5.25. Expansion Slots..... 72
Table 6.1. I/O Port Addresses..... 76
Table 6.2. Hardware Interrupt Levels (Factory Settings) 77

1. Introduction

The BOX-PC is a FA computer incorporating the required features into a compact unit. CONTEC provides four different types of BOX-PCs so that you can construct the optimum built-in controller for your need: Model C with PCMCIA slots, Model CP with PCMCIA slots and PCI/ISA expansion slots, Model E with LAN interface, and Model EP with LAN interface and PCI/ISA expansion slots.

Features

- Fast CPU (MMX Pentium 266)
- Fan-less structure with a large heat sink
- LCD interface that can directly connect a CONTEC VGA or SVGA flat panel display
- PCMCIA slots (TYPE II x 2) (Model C and CP)
- Ethernet interface (100/10M) (Models E and EP)
- Expansion slots (for up to two PCI and/or ISA half-size boards). (Model EP and CP)
- High reliability guaranteed by development and production management by CONTEC (ISO-9001 certified factory)

Limited One-Year Warranty

CONTEC Interface boards are warranted by CONTEC Co., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

*** No product will be accepted by CONTEC group without the RMA number.**

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

2. Overview

Specifications

Table 2.1. Function Specifications

Model		IPC-BX/M560(PCW)C	IPC-BX/M560(PCW)E	IPC-BX/M560(PCW)EP	IPC-BX/M560(PCW)CP
CPU		MMX Pentium 266MHz (Intel)			
Chip Set		430TX (Intel)			
Memory	L2 Cache	512KByte PB-SRAM			
	Main Memory	144 pin SO-DIMM socket x 2 (Memory modules are optional.) Up to 256MB (Initially none). 3.3V 144pin SDRAM type SO-DIMMs are acceptable.			
	BIOS ROM	128KByte E0000H~FFFFFH (AWARD)			
Video	Controller	69000 (Chips & Technologies)			
	Video RAM	2MByte			
	Video BIOS	40KB (C0000H to CFFFFH) or 32KB (C0000H to C7FFFH)			
	CRT I/F	15pin HD-SUB connector 640 x 480/800 x 600 (16M Color), 1024 x 768 (65K Color), 1280 x 1024 (256 Color)			
	LCD I/F	TFT color LCD: 6bits for R/G/B signals, respectively Dedicated 50pin half-pitch connector (CONTEC flat panel display acceptable)			
FDD I/F		Dedicated 26pin half-pitch connector 2 mode (Optional FDD: PC-FDD25BH)			
IDE HDD I/F		Capable of incorporating one 2.5inch IDE HDD or silicon disk drive (Drives are optional.)			
Serial interfaces		RS-232C (general-purpose): 2channels (serial ports 1 and 2) with DB-9 connectors RS-232C (touch panel): 1channel (serial port 3) [in the LCD connector] *1 RS-422/485 (general-purpose): 1channel (serial port 4) [in the RAS connector]			
Parallel interface		Centronics-compatible bidirectional DB-25 connector			
LAN	I/F	---	Ethernet 100Base-TX/10Base-T RJ-45 connector		---
	Controller	---	21143 (Intel)		---
USB I/F		2ch			
Keyboard interface		PC/AT keyboard compatible (6pin MINI DIN connector)			
Mouse interface		PS/2 mouse compatible (6pin MINI DIN connector)			
General-purpose input / output		Photocoupler insulation type: 3 input and 3 output channels (Note that one output channel and one input channel are switched for use as a WDT external output and remote reset input, respectively.)			
RAS functions		WDT: 10ms to 300s (RESET or NMI + external output enabled at a time-out) Remote reset: External input signal			
PC Card *2	Slot	PCMCIA Type I/II x 2 or Type III x 1	---		PCMCIA Type I/II x 2 or Type III x 1
	Controller	RL5C476A (RICOH)	---		RL5C476A (RICOH)
Expansion board slots		---		PCI/ISA shared slot x 2 Maximum acceptable board length: Max. 200mm	
RTC/CMOS		Backed up by a lithium battery whose lifespan is at least 10 years.(25°C)			
Power supply					
Rated Voltage		100-240VAC (Continuous Input), 50/60Hz			
Maximum Power Consumption	Main Body	40VA		45VA	
	LCD *3	25VA			
	Expansion Slots	---		45VA	
	Total	65VA		115VA	
Expansion board supplied power capacity		---		+5V: 2A -5V: Not supplied +12V: 0.5A -12V: 0.1A	
Outside dimensions (mm)		262(W) x 230(D) x 62(H)		262(W) x 230(D) x 140(H)	
Weight		3.3kg		4.7kg	

*1 Used for the CONTEC touch panel display. (See "Options List" for the applicable product.)

*2 The PC cannot be booted from the PC card. CARD-BUS and ZV Card not support.

*3 Used for Flat panel display IPC-DT/L30S(PC)T.

Table 2.2. Installation Environment Conditions

Item			Requirement
Power supply specifications			
	Allowable duration of momentary power failure		20ms or less
	Dielectric strength		3.0kVAC (input-output), 2.0kVAC (input-FG), 0.5kVAC (output-FG) for one minute each
	Insulation resistance		50MΩ (500VDC)
Environment specifications			
	Ambient operating temperature		0-50ºC (with SDD)
			0-45ºC (with HDD)
			5-45ºC (with FDD)
	Ambient storage temperature *1		-10~60ºC
	Ambient humidity *2		20~90%RH
	Floating dust		Normal
	Corrosive gas		None
	Noise resistance	Line noise	AC line: 2kV, Signal line: 1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
		Electrostatic durability	Contact: 4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2)
			Airborne: 8kV (IEC1000-4-2Level 2, EN61000-4-2Level 3)
	Vibration resistance *3	Sweep durability	10-50Hz/Single-side amplitude 0.15mm; 50-500Hz/2.0G X/Y/Z directions for 23 minutes each (Conforming to JIS C0040 and IEC68-2-6)
		Fixed vibration endurance	16.7Hz/2G, X/Y/Z directions for 30 minutes each (Conforming to JIS C0040 and IEC68-2-6)
	Impact resistance *3		10G in the X/Y/Z directions for 11ms; Half-sine wave (Conforming to JIS C0041 and IEC68-2-27)

*1 When the BOX-PC is stored at an ambient temperature of 0ºC or less, the orientation of the main unit is restricted. (See "Installation Conditions" in Chapter 3 "Hardware Setup".)

*2 Assuming that no floppy disk is used.

*3 Assuming that neither HDD nor FDD is used.

System Configuration and Options

System Configuration

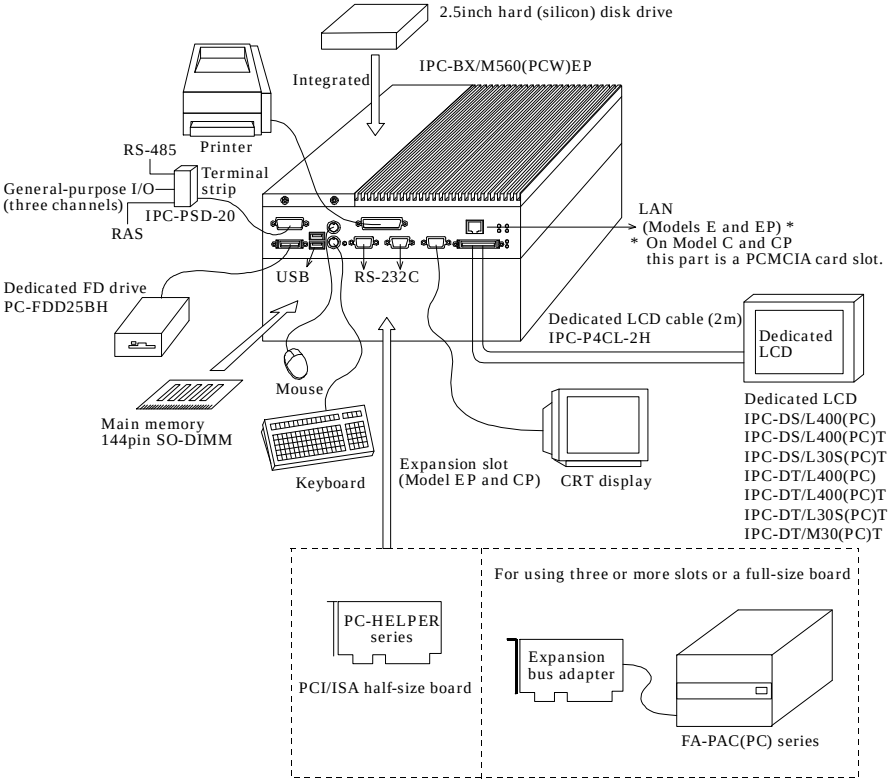


Figure 2.1. System Configuration Diagram

Options List

Memory (144pin SO-DIMM)

- PC-MSD64-144 64-MB SD memory module
- PC-MSD128-144 128-MB SD memory module

Floppy disk unit

- PC-FDD25BH 3.5inch floppy disk drive (with cable)

Hard disk drive

- PC-HDD3200 3.2-GB hard disk

Silicon disk drive

- PC-SDD4A 4-MB flash disk
- PC-SDD12A 12-MB flash disk
- PC-SDD32H 32-MB flash disk
- PC-SDD64H 64-MB flash disk
- PC-SDD320H 320-MB flash disk
- PC-SDD500H 500-MB flash disk
- PC-SDD1000H 1-GB flash disk

Terminal block for RAS connectors

- IPC-PSD-20

Dedicated D-STN Color LCD (12.1inch, 800 x 600 dot S-VGA)

- IPC-DS/L400(PC) Without a touch panel
- IPC-DS/L400(PC)T With a touch panel
- IPC-DS/L30S(PC)T With a touch panel

Dedicated TFT Color LCD (12.1inch, 800 x 600 dot S-VGA)

- IPC-DT/L400(PC) Without a touch panel
- IPC-DT/L400(PC)T With a touch panel
- IPC-DT/L30S(PC)T With a touch panel

Dedicated TFT Color LCD (10.4inch, 640 x 480 dot VGA)

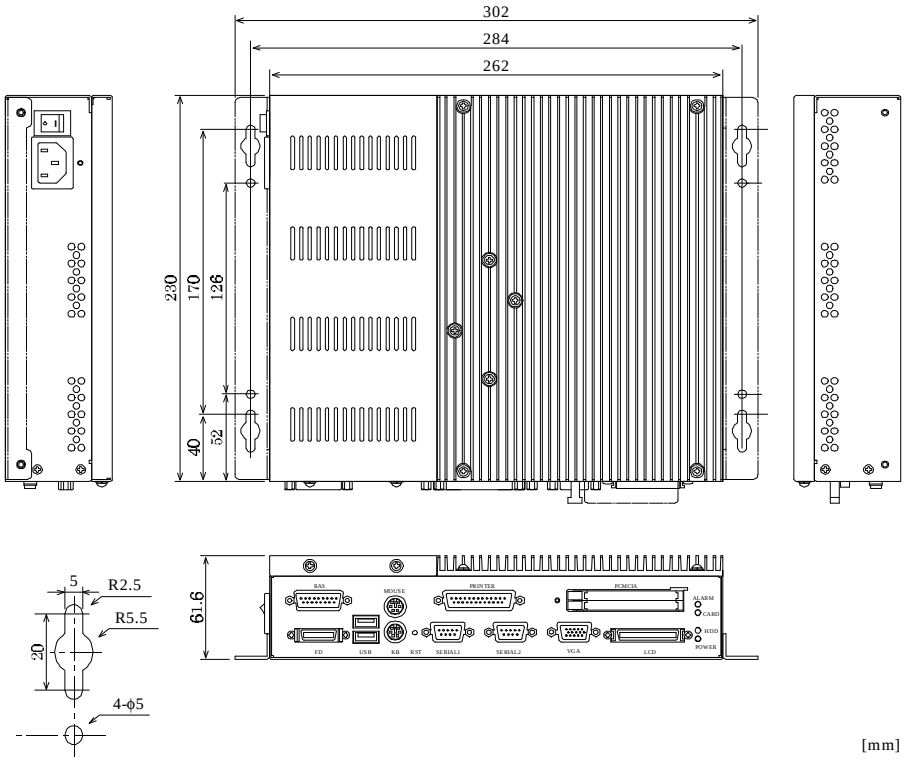
- IPC-DT/M30(PC)T With a touch panel

LCD dedicated cable

- IPC-P4CL-2H Display cable (2m)

Dimensions

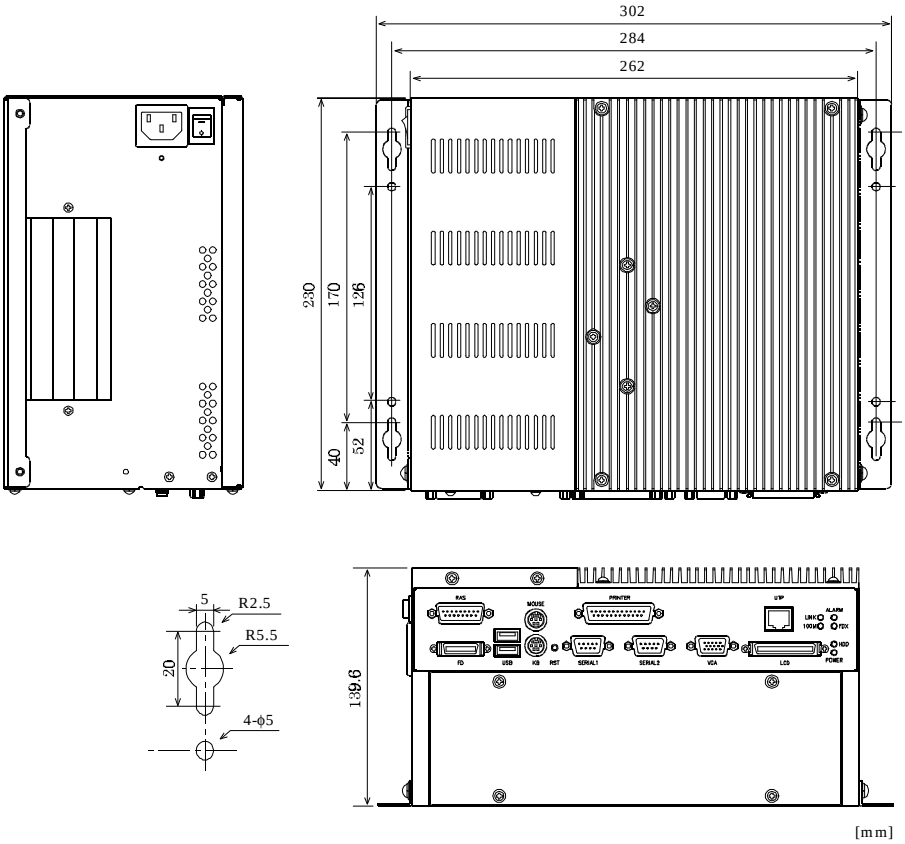
IPC-BX/M560(PCW)E, C



[mm]

Figure 2.2. IPC-BX/M560(PCW)E, C Dimensions

IPC-BX/M560(PCW)EP, CP



[mm]

Figure 2.3. IPC-BX/M560(PCW)EP, CP Dimensions

3. Hardware Setup

Setup Overview

Follow the steps below to set up your BOX-PC according to the instructions in this manual:

Step 1 Installing a hard disk drive and main memory (DIMMs) and Setting Jumper Switches
See Chapter 3 to install the hard disk drive and main memory and set the required jumper switches.

Step 2 Connecting Cables
Connect the cables for the required external devices such as a printer and a CRT display to the BOX-PC.

Step 3 Turning the Power On
Make sure again that you have taken Steps 1 and 2 correctly, then turn the power supply on. If you find or suspect any problem after turning the power on, turn it off immediately and check whether the BOX-PC has been set up correctly.

Step 4 Setting up the BIOS
See Chapter 4 to set up the BIOS. Note that BIOS Setup requires the keyboard and monitor connected correctly to the BOX-PC.

*Be sure to execute "LOAD SETUP DEFAULTS" to initialize the BIOS setup states before using the BOX-PC for the first time. (See "Main Menu" in Chapter 4.)

Setting up Hardware

Removing the top cover and the HDD bracket

- Make sure that the power supply is off in advance.
- Do not loosen any screw other than those specified.

(1) Remove the top cover.

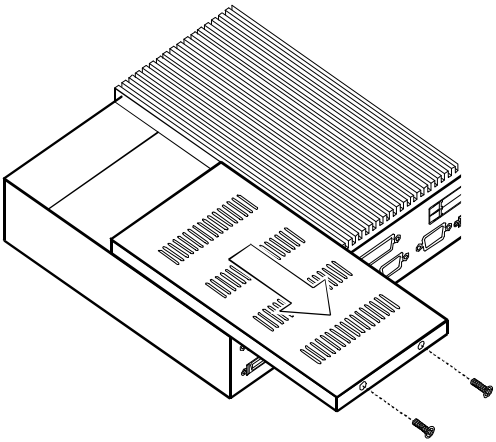


Figure 3.1. Removing the Top Cover

(2) Remove the HDD bracket.

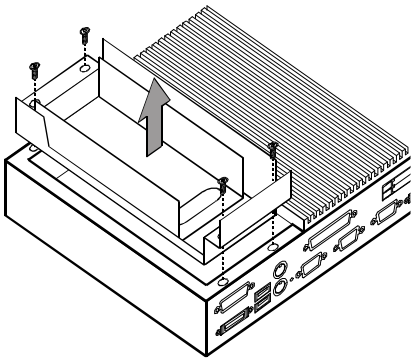


Figure 3.2. Removing the HDD Bracket

Positions and Settings of Connectors and Jumpers

When you have removed the top cover and the HDD bracket, you can see the following jumper as shown below:

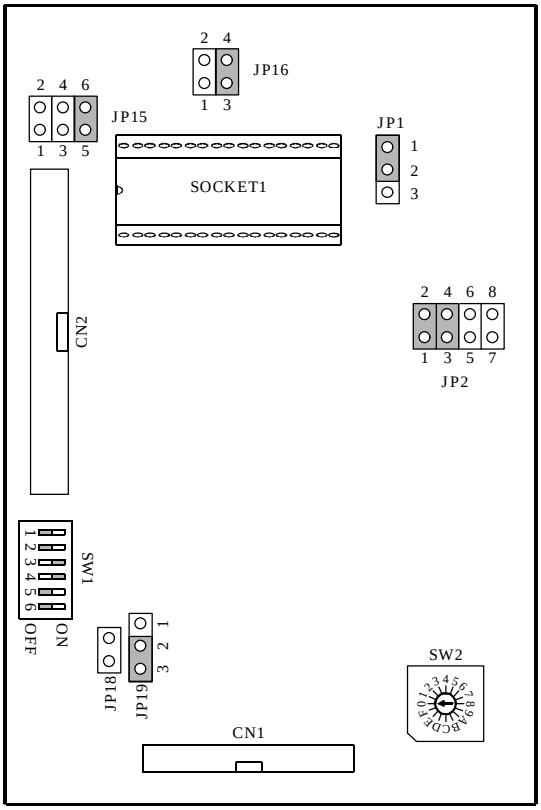


Figure 3.3. Jumpers, Connectors, and Switches under the Top Cover

Table 3.1. Jumpers

No.	Function	Factory setting	Reference page	Remarks
JP1	Reserved	1-2: Connect	---	
JP2	CPU clock multiplier selection	1-2: Connect 3-4: Connect 5-6: Open 7-8: Open	---	266MHz (66MHz x 4)
JP15	Reserved	5-6: Connect	---	
JP16	Reserved	3-4: Connect	---	
JP18	RS-485 termination setting	Open	41	
JP19	RS-485 receiver gate control	2-3: Connect	43	
SW1	WDT output setting, RAS port selection	1, 2, 5, 6 OFF 3, 4 ON	53 60	RAS port: 0138h
SW2	Display setting	0	68	SVGA LCD mode

Table 3.2. Internal Connectors

Name	Function	Reference page
CN1	Primary IDE connector (44pin pin header)	70
CN2	Secondary IDE connector (44pin pin header)	70
SOCKET1	Spare socket	---

Installing the Hard Disk Drive

(1) Connect the HDD cable bundled with the hard disk (silicon disk) drive.

Note!

Connect the HDD cable with its connector justified to the left-hand side of the connector on the back of the HDD. The four right-most pins in the HDD connector are left unconnected, which are master/slave setting pins. Use meticulous care when connecting the HDD cable because turning the power on with the connector shifted to the right may damage the HDD and/or the cable.

(2) Fasten the HDD onto the HDD bracket using four screws with the cable passing through the slot in the HDD bracket.
- Use upper screw holes in the HDD bracket.
- Use either inner or outer screw holes in the HDD bracket, depending on the type of the HDD you are installing. (The inner screw holes are used in the example in Figure 3.4. below.)

(3) Connect the other end of the HDD cable to CN1 on the main unit and mount the HDD bracket on the main unit using four screws.

(4) Close the top cover and tighten the screws.

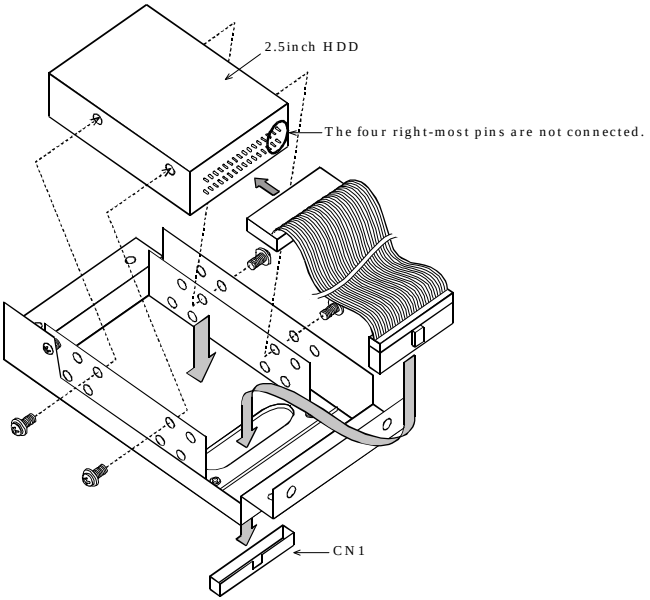


Figure 3.4. Mounting the HDD

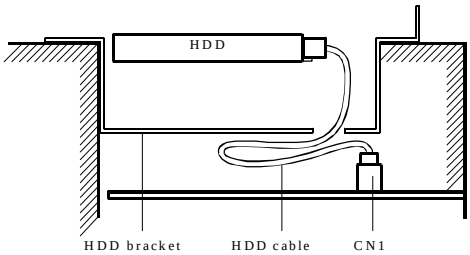


Figure 3.5. Mounting the HDD (Side View)

Installing Main Memory (DIMMs)

Acceptable types of DIMMs

Although CONTEC recommends using the dedicated option, the BOX-PC can use the following types of SO-DIMMs available on the market instead:

- Package type : 144pin small outline DIMM
- Specifications : 3.3V, access time of 60ns or less
- Capacity : 16/32/64/128MB
- Architecture : SDRAM
- Optional memory * : 64MB : PC-MSD64-144
  128MB : PC-MSD128-144

* Using a memory product other than the dedicated option may yield unpredictable results.

Main memory (DIMM) installation procedure

(1) Remove the memory cover.

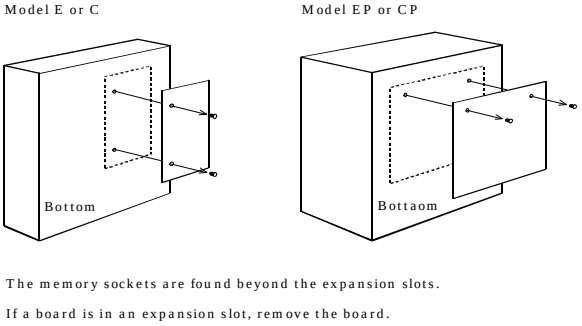

Model E or C
Model EP or CP
Bottom
Bottaom
The memory sockets are found beyond the expansion slots.
If a board is in an expansion slot, remove the board.

Figure 3.6. Removing the Memory Cover

(2) Follow the steps below to install a DIMM in an on-board DIMM socket.
When installing only one DIMM, you can use either of the two DIMM sockets.

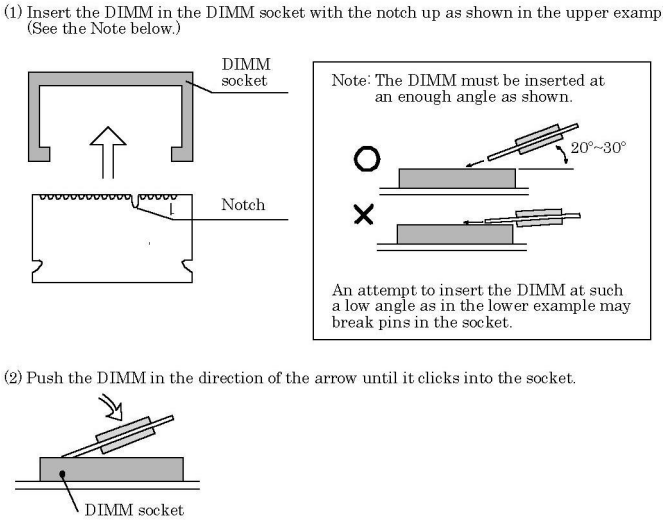

(1) Insert the DIMM in the DIMM socket with the notch up as shown in the upper example.
(See the Note below.)
DIMM socket
Notch
Note: The DIMM must be inserted at an enough angle as shown.
20°~30°
An attempt to insert the DIMM at such a low angle as in the lower example may break pins in the socket.
(2) Push the DIMM in the direction of the arrow until it clicks into the socket.
DIMM socket

Figure 3.7. DIMM Attaching Method

DIMM removing method

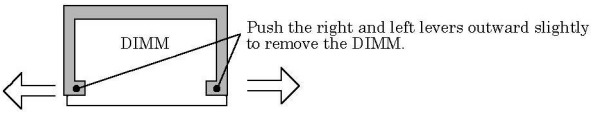


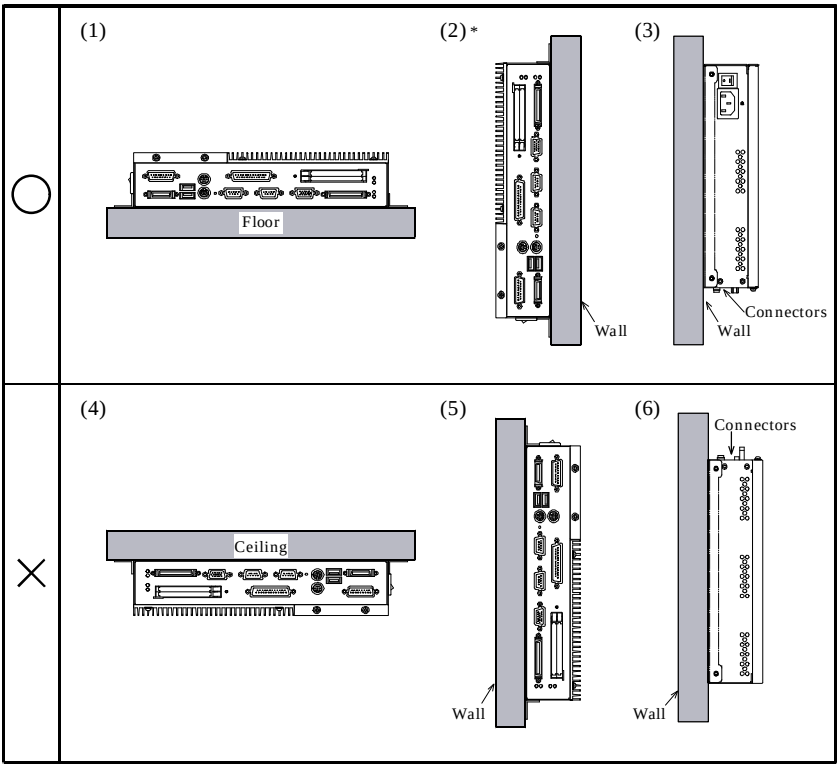
Figure 3.8. DIMM Removing Method

(3) Close the memory cover.

Installation Conditions

The BOX-PC can be installed in any of forms (1) to (3) shown below. Do not install the BOX-PC in any of forms (4) to (6) because it may be hard to release heat sufficiently. Allow clearance of at least 100mm above and 50mm next to and behind the main unit.

Installation orientations



* Do not install the BOX-PC in form (2) if the ambient storage temperature is 0ºC or less.

Figure 3.9. Installation Orientations

Distances between the Main Unit and the Surroundings

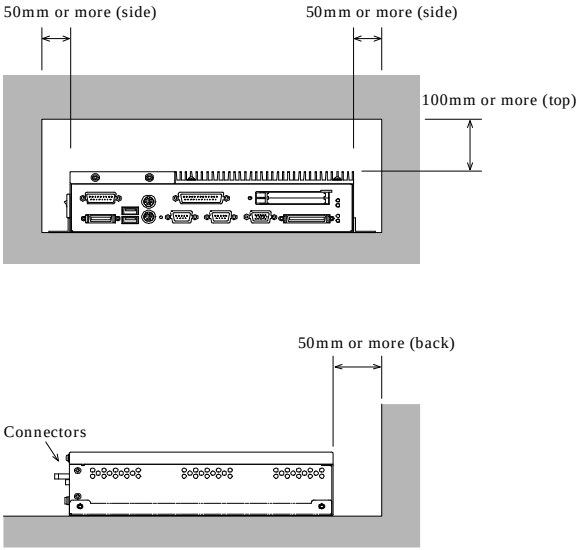


Figure 3.10. Distances between the Main Unit and the Surroundings

4. BIOS Setup

Setting up the BIOS

BIOS Setup is the program for making a variety of initial settings for the entire system at every (re)boot. When using your BOX-PC for the first time, therefore, be sure to run BIOS Setup. Once run, BIOS Setup backs up the settings you made.

Invoking BIOS Setup

When you turn the system power on, the following screen appears as long as the system is normal. Press the <Del> key at the keyboard.

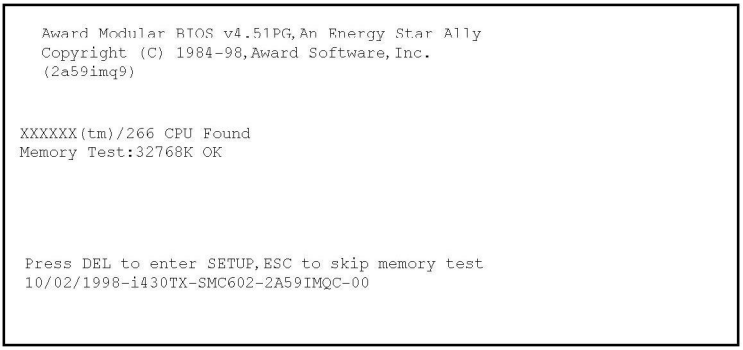

Award Modular BIOS v4.51PG,An Energy Star Ally
Copyright (C) 1984-98,Award Software,Inc.
(2a59imq9)
XXXXXX(tm)/266 CPU Found
Memory Test:32768K OK
Press DEL to enter SETUP,ESC to skip memory test
10/02/1998-i430TX-SMC602-2A59IMQC-00

Figure 4.1. Initial Screen

Key Operations

Table 4.1 lists the functions of the major keys to be used during setup.

Table 4.1. Key Functions

Key	Function
↑, ↓, →, ←	Selects the item to be set up.
<Enter>	Switches the screen from the Main Menu to the Setup Menu for the currently selected item.
PU, PD, +, −	Changes the current setting.
<Esc>	Main Menu : Aborts BIOS Setup without saving changes to settings. Setup Menu: Returns to the Main Menu.
F10	Saves setting data and terminates BIOS Setup if pressed with the Main Menu displayed.

Main Menu

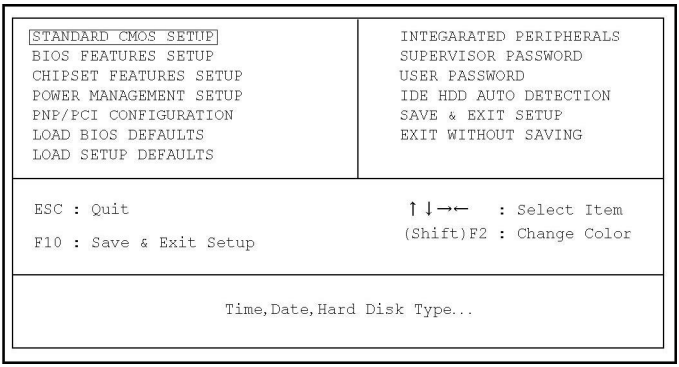


Figure 4.2. Main Menu Screen

STANDARD CMOS SETUP : Set up the clock/calendar and IDE hard disks.

BIOS FEATURES SETUP : Set up the boot drive sequence, cache memory, and shadow memory.

CHIPSET FEATURES SETUP : You should leave this setup untouched.

POWER MANAGEMENT SETUP : Set up the power save mode. When the BOX-PC contains a hard disk drive, set the period of HDD Power Down time to suspend the HDD after no access for that period of time, protecting the HDD from excessively wearing.

PNP/PCI CONFIGURATION : Manually make bus settings such as the IRQs to the PCI bus.

LOAD BIOS DEFAULTS : Reset the BIOS setup items to the minimum required values. Use this option to if the system malfunctions.

LOAD SETUP DEFAULTS	: Reset the BIOS setup items to the normally used, optimum values. Select this option once when you use the BOX-PC for the first time, then change settings as required.
INTEGRATED PERIPHERALS	: Set up the IDE and serial/parallel controllers.
SUPERVISOR PASSWORD	: Set the password that is prompted for input at a (re)boot and at BIOS setup.
USER PASSWORD	: Set the password that is prompted for input at a (re)boot.
IDE HDD AUTO DETECTION	: Detect the currently connected IDE HDD. Usually, this option is not required when TYPE and MODE for the HDD on the STANDARD CMOS SETUP menu have been set to AUTO.
SAVE & EXIT SETUP	: Save all changes you made to the BIOS settings and terminates BIOS Setup.
EXIT WITHOUT SAVING	: Quit BIOS Setup without saving any changes you made to the BIOS settings.

STANDARD CMOS SETUP

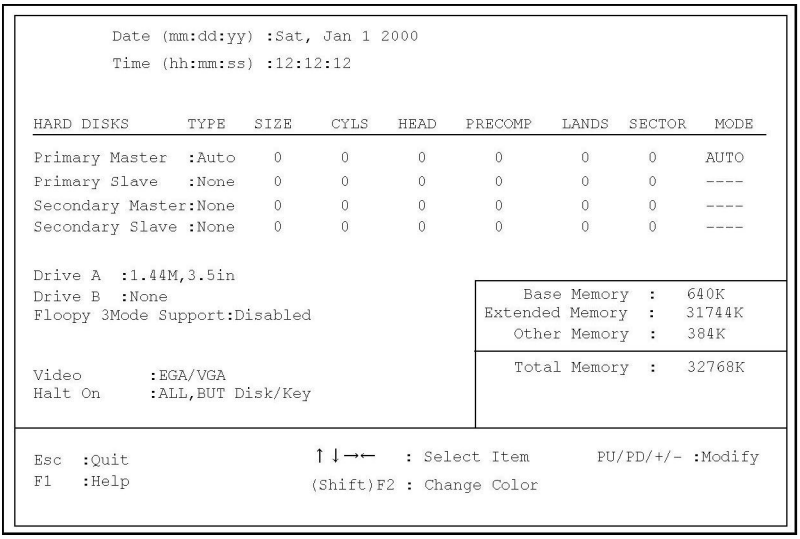

Date (mm:dd:yy) :Sat, Jan 1 2000
Time (hh:mm:ss) :12:12:12
HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDS SECTOR MODE
Primary Master :Auto 0 0 0 0 0 0 AUTO
Primary Slave :None 0 0 0 0 0 0 ----
Secondary Master:None 0 0 0 0 0 0 ----
Secondary Slave :None 0 0 0 0 0 0 ----
Drive A :1.44M,3.5in
Drive B :None
Floopy 3Mode Support:Disabled
Base Memory : 640K
Extended Memory : 31744K
Other Memory : 384K
Total Memory : 32768K
Video :EGA/VGA
Halt On :ALL,BUT Disk/Key
Esc :Quit
F1 :Help
↑↓→← : Select Item
(Shift)F2 : Change Color
PU/PD/+/- :Modify

Figure 4.3. STANDARD CMOS SETUP Screen

Date (mm:dd:yy) : Set the clock/calendar in the main unit to the current date.

Time (hh:mm:ss) : Set the clock/calendar in the main unit to the current time.

Primary Master : Set up the master HDD connected to the primary IDE connector (CN1).

Primary Slave : Set up the slave HDD connected to the primary IDE connector (CN1). (Normally, the primary slave HDD is not used on this machine.)

Secondary Master : Set up the master HDD connected to the secondary IDE connector (CN2). (Normally, the secondary master HDD is not used on this machine.)

Secondary Slave : Set up the slave HDD connected to the secondary IDE connector (CN2). (Normally, the secondary slave HDD is not used on this machine.)

* Set TYPE and MODE usually to [AUTO]. (The HDD type will be detected automatically at a (re)boot.)

* For each HDD which is not used (connected), set TYPE to [NONE].

Drive A : Select the FDD type. Leave [1.44M, 3.5in] as it is on this machine.

Drive B : Leave NONE as it is because this machine does not use the secondary FDD.

Floppy 3Mode Support : Leave [Disabled] as it is because this machine does not support the 3 mode FDD.

Video : Leave [EGA/VGA] as it is.

Halt On : Select the error condition that stops the system if it occurs at a (re)boot.

[All Errors] : Stops the system on occurrence of any error.

[No Errors] : Prevents any error from stopping the system on occurrence of it.

[All,But Keyboard] : Stops the system on occurrence of a non-keyboard error.

[All,But Diskette] : Stops the system on occurrence of a non-FDD error.

[All,But Disk/Key] : Stops the system on occurrence of a non-keyboard and non-FDD error. If you select this option, the system is booted without stopping even with neither FDD nor keyboard connected.

BIOS FEATURES SETUP

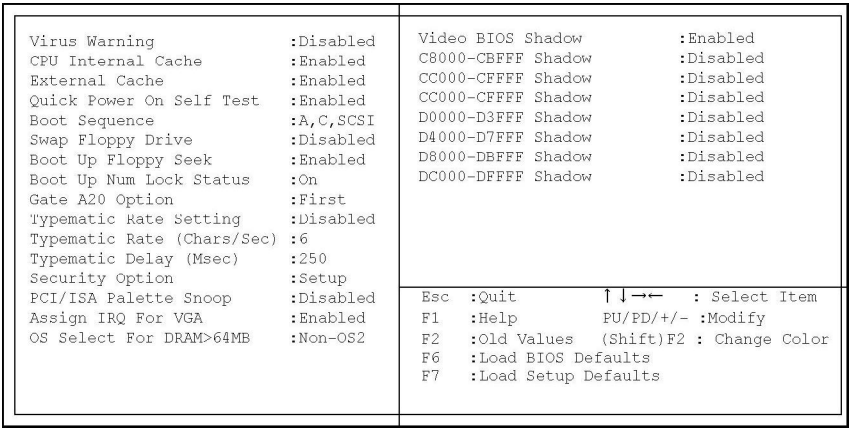

Virus Warning :Disabled
CPU Internal Cache :Enabled
External Cache :Enabled
Quick Power On Self Test :Enabled
Boot Sequence :A,C,SCSI
Swap Floppy Drive :Disabled
Boot Up Floppy Seek :Enabled
Boot Up Num Lock Status :On
Gate A20 Option :First
Typematic Rate Setting :Disabled
Typematic Rate (Chars/Sec) :6
Typematic Delay (Msec) :250
Security Option :Setup
PCI/ISA Palette Snoop :Disabled
Assign IRQ For VGA :Enabled
OS Select For DRAM>64MB :Non-OS2
Video BIOS Shadow :Enabled
C8000-CBFFF Shadow :Disabled
CC000-CFFFF Shadow :Disabled
CC000-CFFFF Shadow :Disabled
D0000-D3FFF Shadow :Disabled
D4000-D7FFF Shadow :Disabled
D8000-DBFFF Shadow :Disabled
DC000-DFFFF Shadow :Disabled
Esc :Quit ↑↓→← : Select Item
F1 :Help PU/PD/+/- :Modify
F2 :Old Values (Shift)F2 : Change Color
F6 :Load BIOS Defaults
F7 :Load Setup Defaults

Figure 4.4. BIOS FEATURES SETUP Screen

Virus Warning : Setting this item to [Enabled] prevents the boot sector and partition table on the hard disk from being write-accessed inadvertently (via the BIOS). If an attempt is made to write to the boot sector or partition table with this item set to [Enabled], the system stops with a message. Note, however, that the item must be set to [Disabled] when you install an OS.

CPU Internal Cache : You can set the CPU's internal cache to [Disabled] if necessary. Usually, leave it [Enabled].

External Cache : You can set the L2 cache to [Disabled] if necessary. Usually, leave it [Enabled].

Quick Power On Self Test : Setting this item to [Enabled] run the POST confirmation message from being displayed.

Boot Sequence	: Set the sequence of drives to be accessed at a boot. The drives are accessed in the order in which they are specified here and the OS encountered first is loaded.
Swap Floppy Drive	: Leave this item [Disabled].
Boot Up Floppy Seek	: If [Enabled], the system seeks the FDD at a boot.
Boot Up Num Lock Status	: Specify the Num Lock key status upon completion of boot-up.
Gate A20 Option	: Usually, leave this item set to [First].
Typematic Rate Setting	: Although you can enable the typematic feature, set this item usually to [Disabled]. Setting this item to [Enabled] enables the following two key settings:
Typematic Rate (Char/Sec)	: Set the repeat detection rate with a key held down.
Typematic Delay (Msec)	: Set the interval between the key press and the first repeat of the keystroke.
Security Option	: Specify the timing(s) at which the password is prompted. Setting this item to [Setup] prompts the password at BIOS setup. Setting it to [System] prompts the password at every (re)boot and BIOS setup. The system prompts no password when no password has been set.
PCI/VGA Palette Snoop	: Leave this item [Disabled].
Assign IRQ For VGA	: Leave this item [Enabled].

OS Select For DRAM>64MB : You can select [OS2] to run the machine with at least 64M bytes of DRAM under OS2. To use any other OS, set this item to [Non-OS2].

Video BIOS Shadow : Setting this item to [Enabled] copies the contents of video BIOS ROM to RAM. This makes access to the video BIOS faster than in ROM.

C8000-CBFFF Shadow
CC000-CFFFF Shadow
D0000-D3FFF Shadow
D4000-D7FFF Shadow
D8000-DBFFF Shadow
DC000-DFFFF Shadow : If ROM has been located in the specified area, setting the item to [Enabled] copies the contents to RAM. Although this speeds up access to that area, be sure to set the item to [Disabled] if the contents of the area are variable.

POWER MANAGEMENT SETUP

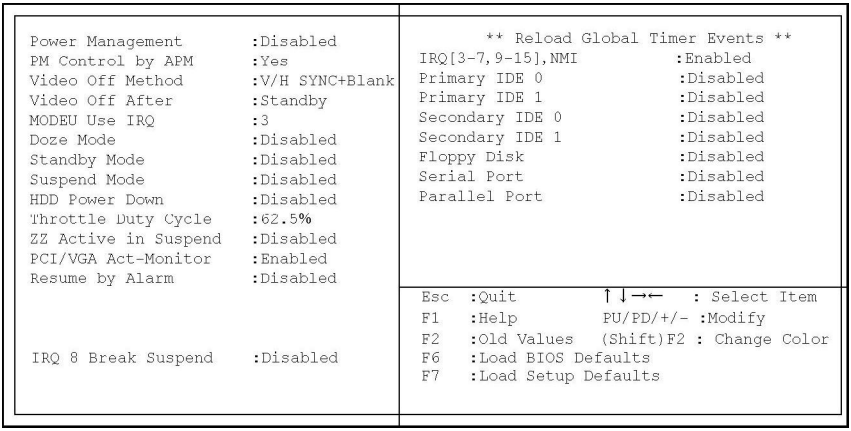

Power Management :Disabled
PM Control by APM :Yes
Video Off Method :V/H SYNC+Blank
Video Off After :Standby
MODEU Use IRQ :3
Doze Mode :Disabled
Standby Mode :Disabled
Suspend Mode :Disabled
HDD Power Down :Disabled
Throttle Duty Cycle :62.5%
ZZ Active in Suspend :Disabled
PCI/VGA Act-Monitor :Enabled
Resume by Alarm :Disabled
IRQ 8 Break Suspend :Disabled
** Reload Global Timer Events **
IRQ[3-7,9-15],NMI :Enabled
Primary IDE 0 :Disabled
Primary IDE 1 :Disabled
Secondary IDE 0 :Disabled
Secondary IDE 1 :Disabled
Floppy Disk :Disabled
Serial Port :Disabled
Parallel Port :Disabled
Esc :Quit ↑↓→← : Select Item
F1 :Help PU/PD/+/- :Modify
F2 :Old Values (Shift)F2 : Change Color
F6 :Load BIOS Defaults
F7 :Load Setup Defaults

Figure 4.5. POWER MANAGEMENT SETUP Screen

Power Management : Set the power management service status. Setting this item to [User Define] allows you to set the individual items. If you use an IDE HDD while power management is not used, set the item to [User Define] and set the period of HDD Power Down time to reduce degradation of the lifespan of the HDD by continuous operation.

PM Control by APM : Enable or disable control by APM (Advanced Power Management).

Video Off Method : Select the method of turning the monitor off.

Video Off After : Select the mode in which the monitor is turned off.

Doze Mode : Set the period of time after which the CPU slows down the operating speed.

Standby Mode : Set the period of time after which the HDD and the monitor are turned off.

Suspend Mode	: Set the period of time after which all peripheral devices are turned off.
HDD Power Down	: Set the period of time after the last access to the HDD, after which the HDD is turned off.
Throttle Duty Cycle	: Set the CPU operation ratio in the Doze mode.
ZZ Active in Suspend	: Leave this item [Disabled].
PCI/VGA Act-Monitor	: When this item is [Enabled], a VGA operation returns the peripherals from the suspend mode.
Resume by Alarm	: Set the alarm condition that resumes the system.
Reload Global Timer Events	: If you set an item to [Enabled], the item returns the peripherals from the suspend mode.

PNP/PCI CONFIGURATION

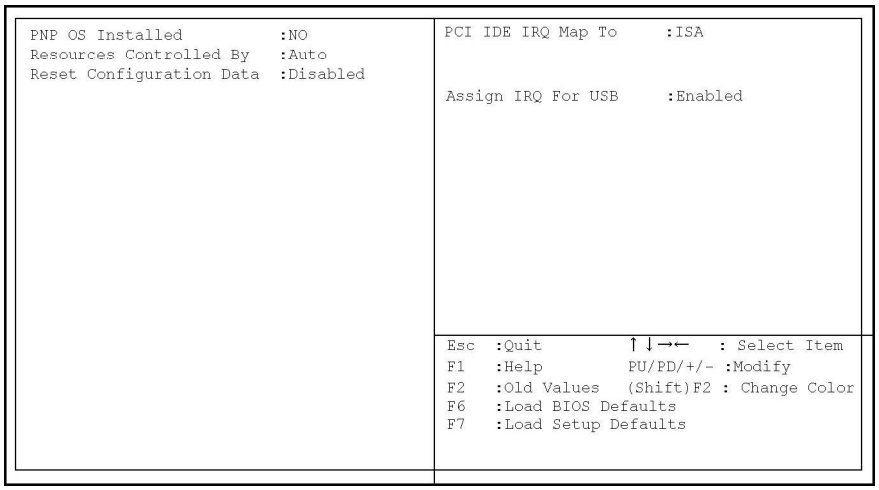


Figure 4.6. PNP/PCI CONFIGURATION Screen

PNP OS Installed : Set this item to [Yes] when you use a PNP (Plug-and-Play) OS.

Resources Controlled By : Setting this item to [Auto] automatically sets the IRQs and DMA channels for PnP devices.

* If your ISA board or PCMCIA card does not operate normally either under an OS (DOS or Windows NT) which is not PnP compliant or by PnP configuration under a PnP compliant OS, set this item to [Manual] and change the IRQ and DMA channel for the ISA board or PCMCIA card to [Legacy ISA].

Reset Configuration Data : Set this item to [Disabled].

PCI IDE IRQ Map To : Set this item to [ISA].

Assign IRQ For USB : Setting this item to [Enabled] assigns an IRQ to the USB controller.

INTEGRATED PERIPHERALS

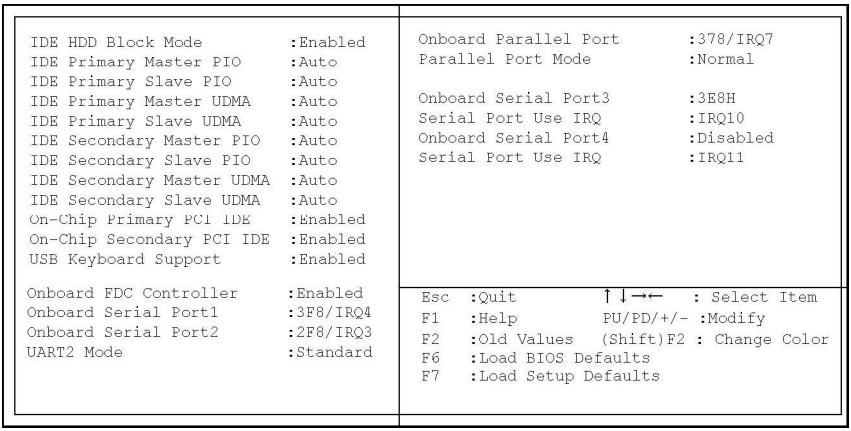

IDE HDD Block Mode :Enabled
IDE Primary Master PIO :Auto
IDE Primary Slave PIO :Auto
IDE Primary Master UDMA :Auto
IDE Primary Slave UDMA :Auto
IDE Secondary Master PIO :Auto
IDE Secondary Slave PIO :Auto
IDE Secondary Master UDMA :Auto
IDE Secondary Slave UDMA :Auto
On-Chip Primary PCI IDE :Enabled
On-Chip Secondary PCI IDE :Enabled
USB Keyboard Support :Enabled
Onboard FDC Controller :Enabled
Onboard Serial Port1 :3F8/IRQ4
Onboard Serial Port2 :2F8/IRQ3
UART2 Mode :Standard
Onboard Parallel Port :378/IRQ7
Parallel Port Mode :Normal
Onboard Serial Port3 :3E8H
Serial Port Use IRQ :IRQ10
Onboard Serial Port4 :Disabled
Serial Port Use IRQ :IRQ11
Esc :Quit ↑↓→← : Select Item
F1 :Help PU/PD/+/- :Modify
F2 :Old Values (Shift)F2 : Change Color
F6 :Load BIOS Defaults
F7 :Load Setup Defaults

Figure 4.7. INTEGRATED PERIPHERALS Screen

IDE HDD Block Mode : Select whether to use the IDE HDD block mode. Usually, set this item to [Enabled].

IDE Primary Master PIO : Set the transfer rate of the master drive connected to the IDE primary connector (CN1). Usually, set this item to [Auto].

IDE Primary Slave PIO :Set the transfer rate of the slave drive connected to the IDE primary connector (CN1). Usually, set this item to [Auto].

IDE Primary Master UDMA : Set the UltraDMA mode of the master drive connected to the IDE primary connector (CN1). Usually, set this item to [Auto].

IDE Primary Slave UDMA	: Set the UltraDMA mode of the slave drive connected to the IDE primary connector (CN1). Usually, set this item to [Auto].
IDE Secondary Master PIO IDE Secondary Slave PIO IDE Secondary Master UDMA Secondary Slave UDMA	: Set the transfer rate (PIO mode) or UDMA mode of the master/slave drive connected to the IDE IDE secondary connector (CN2). Usually, set these items to [Auto].
On-Chip Primary PCI IDE	: Select whether to use the internal primary IDE controller. Usually, set this item to [Enabled].
On-Chip Secondary PCI IDE	: Select whether to use the internal secondary IDE controller. Usually, set this item to [Enabled]. * Setting this item to [Disabled] makes interrupt IRQ15 available to the user.
USB Keyboard Support	: To connect the keyboard to a USB port, set this item to [Enabled].
Onboard FD Controller	: Select whether to use the internal FD controller. Usually, set this item to [Enabled].
Onboard Serial Port 1	: Set the port address and IRQ for internal serial port 1.
Onboard Serial Port 2	: Set the port address and IRQ for internal serial port 2.
UART2 Mode	: This item is not used on this machine. Leave it set to [Standard].
Onboard Parallel Port	: Set the port address and IRQ for the internal parallel port.

Parallel Port Mode	: Set the operation mode of the parallel port.
ECP Mode Use DMA	: Set the DMA channel for the parallel port to be used in the ECP mode.
Onboard Serial Port 3	: Set the port address for internal serial port 3 (touch panel).
Serial Port 3 Use IRQ	: Set the IRT for internal serial port 3.
Onboard Serial Port 4	: Set the port address for internal serial port 4 (RS-422/485).
Serial Port 4 Use IRQ	: Set the IRT for internal serial port 4.

SUPERVISOR PASSWORD

The password set here takes effect when prompted at a boot and BIOS setup. After setting the password, set "Security Option" in the BIOS FEATURES SETUP menu to the desired password prompt timing(s). To disable the password which has been set, press only the Enter key as the new password.

* Be careful not to forget the password set for the machine.

USER PASSWORD

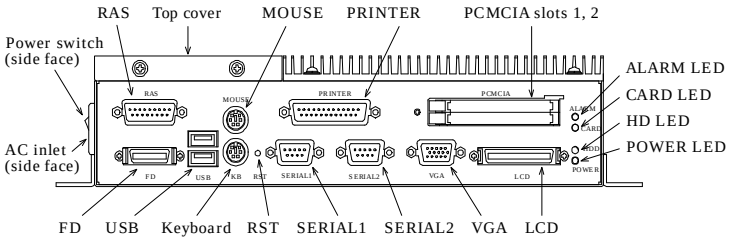
The password set here takes effect when prompted at a boot and BIOS setup (with no supervisor password set). After setting the password, set "Security Option" in the BIOS FEATURES SETUP menu to the desired password prompt timing(s). Note, however, that you cannot use the user password to enter BIOS Setup if the supervisor password has been set. To disable the password which has been set, press only the Enter key as the new password.

* Be careful not to forget the password set for the machine.

5. Functions of Components

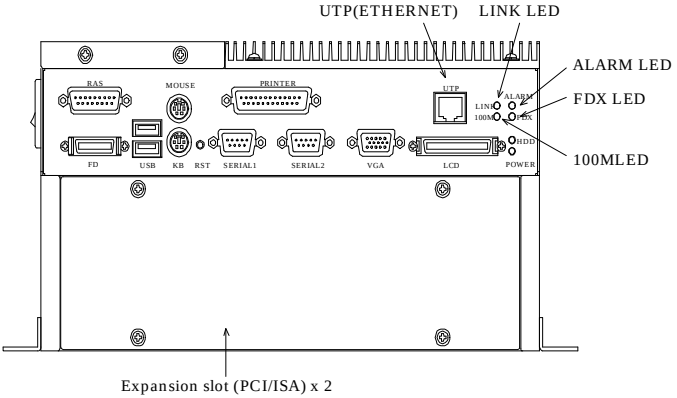
Names of Controls

IPC-BX/M560(PCW)C



* The IPC-BX/M560(PCW)CP is expansion-slot built-in version of Model C.

IPC-BX/M560(PCW)EP



* The IPC-BX/M560(PCW)E is an expansion-slot-less version of Model E.

Figure 5.1. Names of Controls

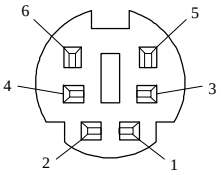
Table 5.1. Functions of Controls

Name	Function	Reference page
KB	Keyboard connector (6pin mini-DIN connector)	37
MOUSE	PS/2 mouse connector (6pin mini-DIN connector)	37
FD	FDD connector (26pin half-pitch connector)	38
SERIAL1	Serial port 1 connector (DB-9 connector)	40
SERIAL2	Serial port 2 connector (DB-9 connector)	40
VGA	CRT connector (DB-15 connector)	49
PCMCIA	PCMCIA card slot (Model C and CP)	50
PRINTER	Parallel port connector (DB-25 connector)	52
RAS	RAS feature and RS-485 connector (DB-15 connector)	53
RST	Hardware reset pushbutton	65
ALARM LED	RAS alarm indicator	65
USB	USB port connectors	66
UTP	Ethernet connector (Models E and EP)	67
LCD	LCD connector (50pin half-pitch connector)	68
EXPANSION SLOT	PCI/ISA expansion board slot x 2 (Model EP and CP)	72
POWER LED	Power-on indicator	---
HD LED	Internal hard disk access lamp	---
CARD LED	PCMCIA card access lamp (Model C and CP)	---
LINK LED	Ethernet link indicator (Models E and EP)	67
FDX LED	Ethernet full-duplex mode indicator (Models E and EP)	67
100M LED	Ethernet 100Mbps indicator (Models E and EP)	67

Keyboard Interface

The BOX-PC has a keyboard connector designated as KB (6pin MINI-DIN connector).

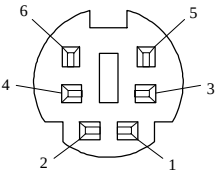
Table 5.2. Keyboard Connector

Connector type	TCS7910-16-201 (Hoshiden) or equivalent		
			
Pin No.	Signal name	Pin No.	Signal name
1	+KBD DATA	5	+KBD CLK
2	N.C.	6	N.C.
3	GND	SHELD	GND
4	+5.0V DC	---	

Mouse Interface

The BOX-PC has a mouse connector designated as MOUSE (6pin MINI-DIN connector).

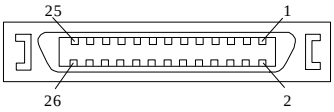
Table 5.3. Mouse Connector

Connector type	TCS7910-16-201 (Hoshiden) or equivalent		
			
Pin No.	Signal name	Pin No.	Signal name
1	+MOUSE DATA	5	+MOUSE CLK
2	N.C.	6	N.C.
3	GND	SHELD	GND
4	+5.0V DC	---	

Floppy Disk Interface

The BOX-PC has an FD controller, allowing the FD connector on the front panel to accept one FD drive. The connector is designated as FD.
As the FD drive, use the dedicated option.

Table 5.4. FD Connector

Connector type	26pin half-pitch connector: 175928-4(AMP) or equivalent				
					
Pin No.	Signal name	Direction	Pin No.	Signal name	Direction
1	HDSEL	Output	2	WRTPRT	Input
3	RDATA	Input	4	TRK0	Input
5	GND	-----	6	GND	-----
7	GND	-----	8	WGATE	Output
9	GND	-----	10	GND	-----
11	WDATA	Output	12	GND	-----
13	DENSEL	Output	14	STEP	Output
15	DENSEL	Output	16	DIR	Output
17	N.C.	-----	18	MTR_ON	Output
19	DRV_SEL	Output	20	N.C.	-----
21	+5V	-----	22	DSKCHG	Input
23	+5V	-----	24	N.C.	-----
25	INDEX	Input	26	+5V	-----

Acceptable cable-side connectors

Plug connector : AMP, P/N 1756774-4
(AWG #28 for pressure welding)
Shield case kit : AMP, P/N 1756774-4
or
Plug connector : 3M, P/N 10126-6000EL
(AWG #28 for pressure welding)
Shell : 3M, P/N 10326-3210-000
or
Plug connector : 3M, P/N 10126-3000VE
(AWG #24-#30 with solder)
Shell system : 3M, P/N 10326-52F0-008 (Non-shield shell kit)

Cable length

The FDD cable should be within 60cm.

Serial Port Interface

RS-232C Port (SERIAL PORT 1, 2)

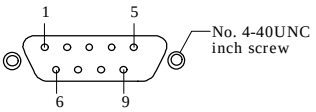
The BOX-PC has two RS-232C serial port connectors (serial port 1 designated as SERIAL1 and serial port 2 as SERIAL2). Each port can be set up as COM1 to COM4 or as being unused by BIOS Setup (described in Chapter 4). (Note, however, that the same COM number cannot be assigned to different ports).

Table 5.5. I/O Addresses and IRQs for SERIAL1/2

COM	I/O address range	IRQ
1	3F8h-3FFh	IRQ 4
2	2F8h-2FFh	IRQ 3
3	3E8h-3EFh	IRQ 4
4	2E8h-2EFh	IRQ 3

Table 5.6. Serial Port Connectors

Connector on the main unit	DB-9 connector (male)



Pin No.	signal name	Description	Direction
1	CD	Carrier detect	Input
2	RD	Receive data	Input
3	TD	Transmit data	Output
4	DTR	Data terminal ready	Output
5	GND	Signal ground	-----
6	DSR	Data set ready	Input
7	RTS	Request to send	Output
8	CTS	Clear to send	Input
9	RI	Ring indicator (RI)	Input

RS-422/RS-485 port (SERIAL PORT4)

The RAS connector contains a single-channel serial port for which an I/O address range and IRQ or the "unused" status can be set by BIOS Setup (described in Chapter 4). (Note that the I/O address range or IRQ assigned to any other device cannot be assigned.)

Table 5.7. I/O Addresses and IRQ for SERIAL4

COM	I/O address range	IRQ
1	3F8h-3FFh	IRQ 3
2	2F8h-2FFh	IRQ 4
3	3E8h-3EFh	IRQ 5
4	2E8h-2EFh	IRQ 10
ORG1 *	130h-137h	IRQ 11
ORG2 *	1E0h-1E7h	IRQ 15

* ORG1 and ORG2 are CONTEC proprietary ports.

RS-422/RS-485 specifications

- Transmission system : Asynchronous, half-/full-duplex serial transmission conforming to RS-422/RS-485
- Baud rate : 19200 to 50bps (programmable)
- Signal extensible distance : 1.2km Max.

Output connector with RS-422/RS-485 used

Table 5.8. Output Connector (RAS Connector) with RS-422/RS-485 Used

Pin No.	Signal name	Description
2	TX +	Transmit data +
10	TX -	Transmit data -
3	RX +	Receive data +
11	RX -	Receive data -

For details on the RAS connector, see Table 5.16. "RAS Connector".

Terminating resistor with RAS-485 used

Set the terminating resistor using JP18 under the top cover. The jumper is open (no terminating resistor) by factory default.

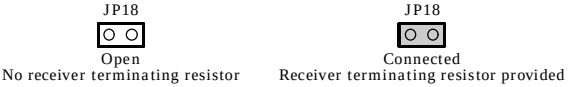


Figure 5.2. Terminating Resistor Setting

Transmit data control in half-duplex mode

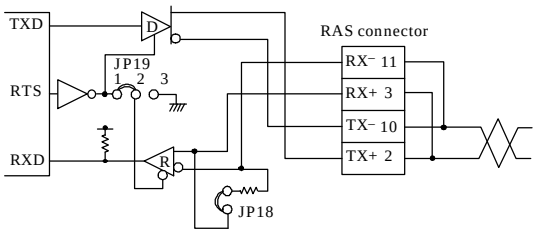
In half-duplex mode, the transmission buffer must be controlled to prevent transmit data from causing a collision. The BOX-PC uses the RTS signal and bit 1 in the modem control register to control transmit data.

Modem control register

(Setting I/O address +4H) bit 1: 0 ···RTS high
(Disables transmission)
1 ···RTS low
(Enables transmission)

Setting the RS-422/RS-485 receiver disable control jumper

When the RS-422/RS-485 port is used, the RTS signal is used for driver enable control. Connecting JP19 pins 1 and 2 disables the receiver at the same time, preventing the port from receiving output data to an external device.



* The input/output connection for RS-485 (two-line transmission) must be done inside the DB connector.

Figure 5.3. Half-duplex Connection (JP19 1-2 Connection)

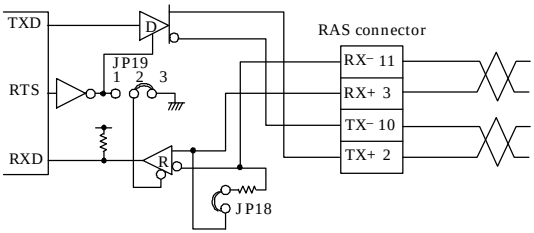


Figure 5.4. Full-duplex Connection (JP19 2-3 Connection)

I/O addresses and instructions

The table below lists I/O addresses for use as COM1.

Table 5.9. I/O Addresses

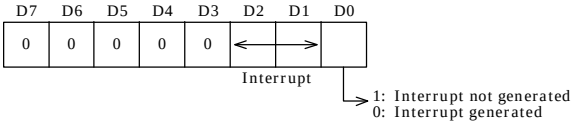
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receiver buffer register	RBR
	1	W	Divisor latch register (LSB)	DLL
03F9H	1	W	Divisor latch register (MSB)	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR
03FCH	X	W	Modem control register	MCR
03FDH	X	R	Line status register	LSR
03FEH	X	R	Modem status register	MSR
03FFH	X	R/W	Scratch register	SCR

DLAB (Divisor Latch Access Bit): Value of bit 7 in the line control register

Table 5.10. Register Functions *<1/4>*

I/O address	Contents
03F8H	THR: Transmitter Holding Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Dedicated register for writing transmit data
03F8H	RBR: Reciever Buffer Register [DLAB=O] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Dedicated register for reading transmit data
03F8H	DLL: Divisor Latch (LSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (LSB)
03F9H	DLH: Divisor Latch (MSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (MSB)
03F9H	IER: Interrupt Enable Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 EMS ELSI ETHREI ERDAI ERDAI: Receive data interrupt enable ETHREI: Receive data register empty interrupt enable ELSI: Receiver line status interrupt enable EMS: Modem status interrupt enable [Always 0] 1: Interrupt enable 0: Interrupt disable

Table 5.10. Register Functions *<2/4>*

<table>
<tr><th>I/O address</th><th>Contents</th></tr>
<tr><td>03FAH</td><td>
IIR : Interrupt Identification Register


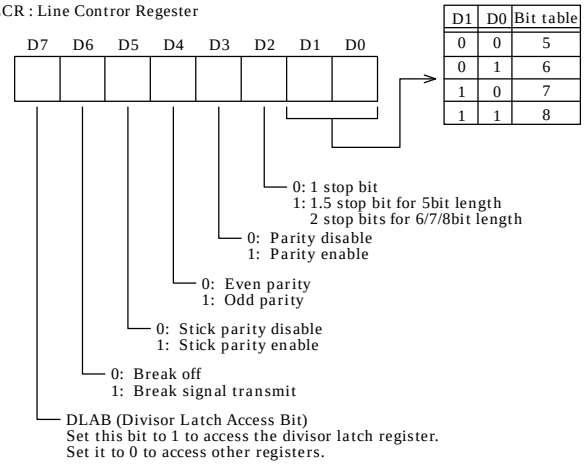
<table>
<tr><th>bit2</th><th>bit1</th><th>bit0</th><th>Priority</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>1</td><td>——</td><td>No interrupt is generated</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1 (Top)</td><td>An interrupt is generated at an overrun error, parity error, framing error, or break interrupt.</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>2</td><td>An interrupt is generated when the receiver buffer register goes ready. It is cleared when the receiver buffer is read.</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>3</td><td>An interrupt is generated when the transmitter holding register becomes empty. It is cleared when the IIR is read or when transmit data is written to the THR.</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>4 (Bottom)</td><td>A modem status interrupt is generated.
(CTS, DSR, RI, CD)
It is cleared when the modem status register is read.</td></tr>
</table>
</td></tr>
<tr><td>03FBH</td><td>
LCR : Line Contror Regester

D7 D6 D5 D4 D3 D2 D1 D0
D1 D0 Bit table
0 0 5
0 1 6
1 0 7
1 1 8
0: 1 stop bit
1: 1.5 stop bit for 5bit length
2 stop bits for 6/7/8bit length
0: Parity disable
1: Parity enable
0: Even parity
1: Odd parity
0: Stick parity disable
1: Stick parity enable
0: Break off
1: Break signal transmit
DLAB (Divisor Latch Access Bit)
Set this bit to 1 to access the divisor latch register.
Set it to 0 to access other registers.
</td></tr>
</table>

Table 5.10. Register Functions *<3/4>*

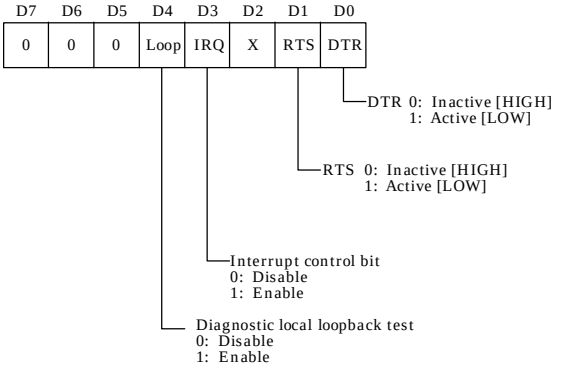
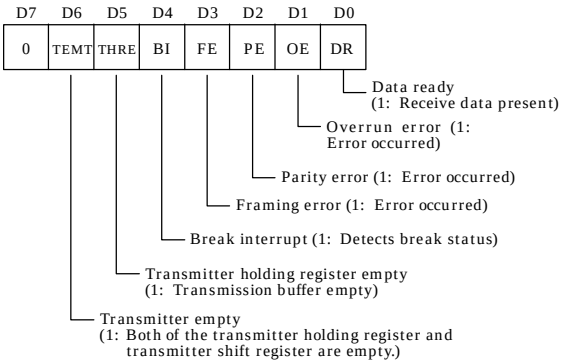
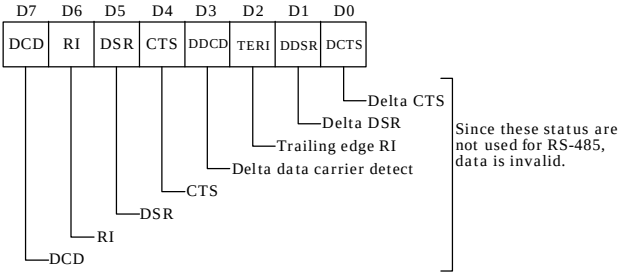
I/O address	Contents
03FCH	MCR: Modem Control Register 
03FDH	LSR: Line Status Regester 

Table 5.10. Register Functions *<4/4>*

I/O address	Contents
03FEH	MSR : Modem Status Register 
03FFH	SCR : Scratchpad Register 8bit readable/writable register. The user can use this register for temporarily saving data.

Setting the baud rate

The baud rate is set with software by dividing the clock input (1.8432MHz). The baud rate is set by writing the corresponding values to the divisor latch registers (LSB, MSB) as shown below:

Table 5.11. Baud Rate Settings

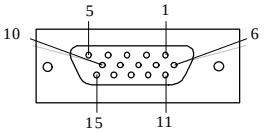
Baud rate	Value written to divisor latch registers	Setting error (%)
50	2304	---
75	1536	---
110	1047	0.026
134 .5	857	0.058
150	768	---
300	384	---
600	192	---
1200	96	---
1800	64	---
2000	58	0.69
2400	48	---
3600	32	---
4800	24	---
7200	16	---
9600	12	---
19200	6	---

Example: To set 9600bps, write 00 and 12 (decimal) to the divisor latch registers (MSB and LSB), respectively.

CRT Interface

The BOX-PC has a CRT interface designated as VGA (DB-15 connector).

Table 5.12. CRT Connector

Connector type	DB-15 connector (Male)		
			
Pin No.	Signal name	Pin No.	Signal name
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	N.C.
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	N.C.
8	GND		

Display driver

The display driver for each OS is available as an option. Purchase the driver separately from the BOX-PC.

Option Display driver soft (Windows 98/95/NT 4.0) :
IPC-DSP2-DRV

PCMCIA Slots (Model C and CP)

The BOX-PC (Model C) has PCMCIA card slots (Type II size slots x 2, including Type III size slot x 1).

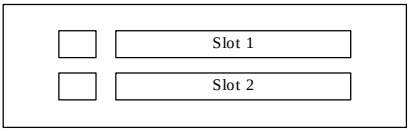


Figure 5.5. Slot Numbers and Positions

Note!

To use a Type III card, insert it in slot 2.

Attaching a card stopper bracket

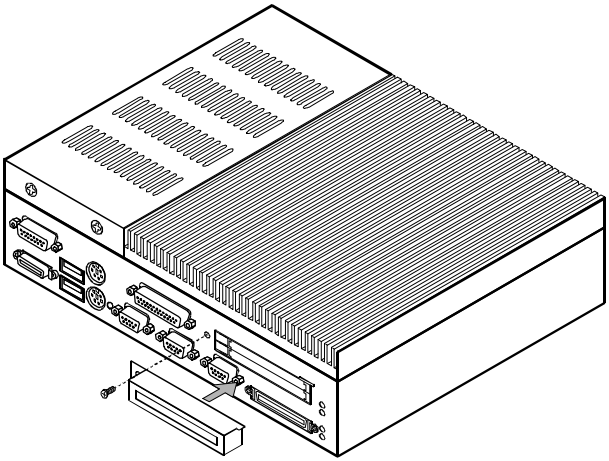


Figure 5.6. Attaching a Card Stopper Bracket

Card power supply

The table below lists the applicable card voltages and the current capacities per slot.

Table 5.13. Card Supplied Power

Voltage	Current capacity (Max.)
+5V	1A/Slot
+3.3V	1A/Slot
+12V	Not supplied

Printer Port Interface

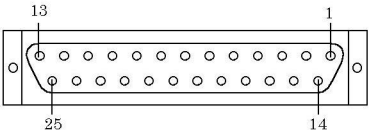
The BOX-PC has a printer port interface designated as PRN. The port can be set up LPT1 to LPT3 or as being unused by BIOS Setup (described in Chapter 4).

Table 5.14. Printer Port and I/O Addresses

LPT	I/O address range	IRQ
1	3BCh-3BFh	IRQ 7
2	378h-37Fh	IRQ 7
3	278h-27Fh	IRQ 5

Table 5.15. Printer Port Connector

Connector on the main unit: DB-25 connector (Female)



Pin No.	Pin name	Description	Direction	Pin No.	Pin name	Description	Direction
1	-STRB	Data valid	Output	14	-AFEED	Automatic feed	Output
2	D 0	Data bit 0	Output	15	-ERROR	Unavailable	Input
3	D 1	Data bit 1	Output	16	-INIT	Initialize	Output
4	D 2	Data bit 2	Output	17	-SELECT-IN	Input enabled	Output
5	D 3	Data bit 3	Output	18	GND	Ground	-----
6	D 4	Data bit 4	Output	19	GND	Ground	-----
7	D 5	Data bit 5	Output	20	GND	Ground	-----
8	D 6	Data bit 6	Output	21	GND	Ground	-----
9	D 7	Data bit 7	Output	22	GND	Ground	-----
10	-ACK	Acknowledge	Input	23	GND	Ground	-----
11	BUSY	Busy	Input	24	GND	Ground	-----
12	PE	Paper empty	Input	25	GND	Ground	-----
13	SELECT	Select state	Input	-----			

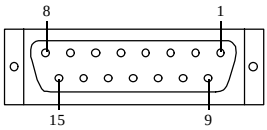
Fixing screw: No. 4-40UNC inch screw

RAS Features

The BOX-PC has watchdog timer, remote reset, and general-purpose I/O functions as RAS features. The inputs and outputs for the individual functions are implemented in the RAS connector.

Table 5.16. RAS Connector

Connector type	DB-15 connector (Female) (DALC-J15SAF-20L9) JAE



Pin No.	Pin name	Function
1	SPK	External speaker signal
9	GND	External speaker ground
2	TX +	RS-485 transmission line
10	TX -	
3	RX +	RS-485 reception line
11	RX -	
4	NCOM	PO2-dedicated minus common pin
12	PO2/WDT	General-purpose output or watchdog timer alarm output
5	PO0	General-purpose output
13	PO1	
6	NCOM	General-purpose output minus common pin
7	PI1	General-purpose input
14	PI2/RST	General-purpose input or remote reset input
8	PCOM	General-purpose input plus common pin
15	PI0/NMI	General-purpose input, NMI interrupt input

Fixing screw: No. 4-40UNC inch screw

Changing the port addresses for RAS features

The I/O port addresses for RAS features can be changed by setting SW1-3 and SW1-4.

Table 5.17. Changing the Port Addresses for RAS Features (SW1-3, SW1-4)

SW1		RAS port addresses	
SW1-3	SW1-4		
ON	ON	0138h~013Dh	* Factory settings
OFF	ON	0338h~033Dh	
ON	OFF	0538h~053Dh	
OFF	OFF	0738h~073Dh	

The "Watchdog Timer" and "General-purpose Inputs/Outputs and Remote Reset" sections that follow assume that the I/O port addresses for RAS features are the factory settings without being changed.

Watchdog Timer

The watchdog timer is activated by output of data (this can be undefined) to I/O port address 0139h. Executing the out instruction to the same port within the pre-set time-out period retriggers the watchdog timer. If a time-out occurs, the watchdog timer generates a reset or an NMI interrupt depending on the port (013Bh) setting. It can also supply an alarm-out output to an external device depending on the port (013Bh) setting.

The time-out period can be set between 10msec and 300sec (port setting, 013Ah).

The watchdog timer stops by reading I/O port address 0139h). The alarm-out output is also canceled at the same time.

The alarm-out signal is output from PO2/WDT (12-pin) in the RAS connector. It is canceled at a reset.

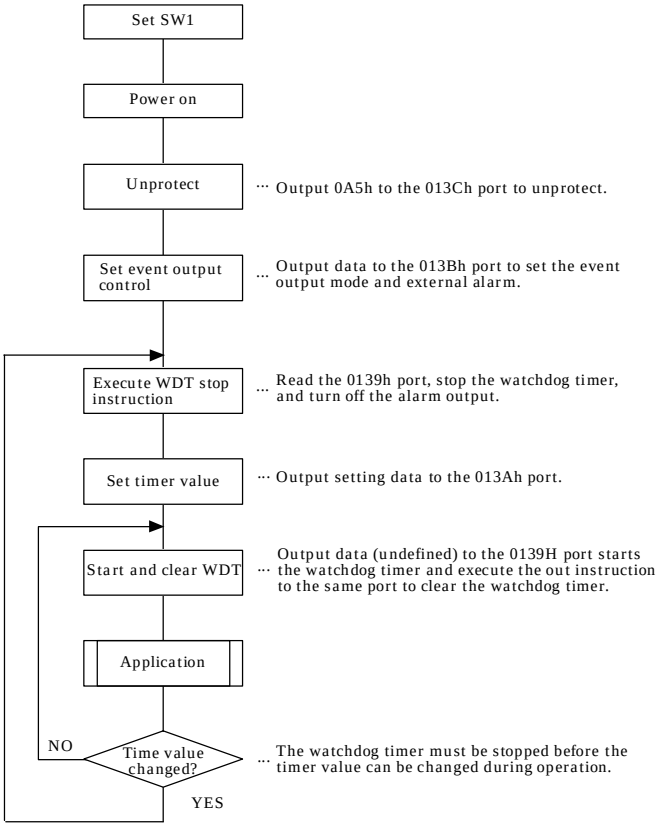
The alarm-out output can be set to the state which exists when the power is turned on by the switch (SW1), when the watchdog timer is started, or when the watchdog timer causes a time-out.

The I/O addresses used for RAS features can be changed by setting SW1.

Specifications

- Time-out period : 10msec to 300sec (Port setting)
- Interrupt or reset : A reset or NMI is generated when a time-out occurs. (Port setting)
- External alarm output : Photocoupler insulated open collector output (The output state is switch-set.) For detailed specifications, see the specifications for general-purpose inputs/outputs.
- I/O address : 0139h to 013Dh (Changeable in 512bytes by the switch)

Usage


Set SW1
Power on
Unprotect
··· Output 0A5h to the 013Ch port to unprotect.
Set event output control
··· Output data to the 013Bh port to set the event output mode and external alarm.
Execute WDT stop instruction
··· Read the 0139h port, stop the watchdog timer, and turn off the alarm output.
Set timer value
··· Output setting data to the 013Ah port.
Start and clear WDT
··· Output data (undefined) to the 0139H port starts the watchdog timer and execute the out instruction to the same port to clear the watchdog timer.
Application
NO
Time value changed?
··· The watchdog timer must be stopped before the timer value can be changed during operation.
YES

* WDT: Watchdog timer

Figure 5.7. sing the Watchdog Timer

I/O Addresses and Instructions

*** 0139h: Watchdog timer control**

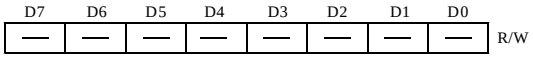


Figure 5.8. WDT Control Port (0139h)

R : Stops the watchdog timer and cancels the alarm. The data read is undefined.

W : Starts and clears the watchdog timer. The data to be output can be undefined.

*** 013Ah: Watchdog timer counter**

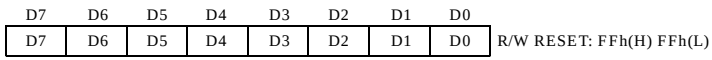


Figure 5.9. WDT Counter Port (013Ah)

R : Reads watchdog timer count data.
Watchdog timer counter time-out period data (16bits) is read. Data is read twice in the L-to-H order. The value read is output not as the current count value but as the count data that has been set.

W : Writes watchdog timer count data.
Watchdog timer counter time-out period data is written. Data is written in the L-to-H order. The clock for the watchdog timer counter is 4.58μsec. The time-out period is set as in the following examples:

0.5sec → 006Dh
1sec → 00DAh
4sec → 0369h
8sec → 06D2h
15sec → 0CC6h
30sec → 1996h
120sec → 6658h
240sec → CCB1h

*** 013Bh: Event output control**

D7	D6	D5	D4	D3	D2	D1	D0	
PO2M	PI2M	rsv*	PI0M	NMIE	rsv*	WDTM	WDTE	R/W RESET: 10X00X00b

Figure 5.10. Event Output Control Port (013Bh)

WDTE : Enables the watchdog timer event output.
- 0 : Disables the output event when the watchdog timer causes a time-out.
- 1 : Enables the output event when the watchdog timer causes a time-out.

WDTM : Watchdog timer event output mode
- 0 : Sets the event output when the watchdog timer causes a time-out to NMI.
- 1 : Sets the event output when the watchdog timer causes a time-out to RESET.

PO2M : PO2/WDT(12) output mode
- 0 : Sets the RAS connector PO2/WDT(12) signal to PO2 (general-purpose output).
- 1 : Sets the RAS connector PO2/WDT(12) signal to alarm-out output.

• The ALARM LED on the front panel of the main unit comes on if an alarm output occurs in the alarm-out output mode.

*** 013Ch: RAS status port & port write control**

D7	D6	D5	D4	D3	D2	D1	D0	
rsv*	rsv*	rsv*	rsv*	—	—	rsv*	WDT	R (RESET: XXXXXXX0B)

Figure 5.11. RAS Status Port (013Ch)

R : RAS status port

WDT : Watchdog timer status

The status of the watchdog timer. This bit is cleared by stopping the watchdog timer (by reading the 0139h).

0 : Watchdog timer either being stopped or counting

1 : Watchdog timer time-out

D7	D6	D5	D4	D3	D2	D1	D0	
WP7	WP6	WP5	WP4	WP3	WP2	WP1	WP0	W

Figure 5.12. RAS Port Protect Port (013Ch)

W : Protects the RAS port (0139h-013Dh).

The RAS port is protected or unprotected. The RAS port is protected when the power is turned on and when a reset occurs.

00h : Protect

A5h : Unprotect

Note!

Do not change the setting for any "rsv" bit because it is system reserved.

*** 013Dh: Switch data**

D7	D6	D5	D4	D3	D2	D1	D0		
rsv*	rsv*	SW6	SW5	—	rsv*	rsv*	rsv*	R	(RESET: XXXXXXX0B)

Figure 5.13. Switch Data (013Dh)

R : Switch data
SW6 : SW1-6 data
0 : SW1-6 on
1 : SW1-6 open
SW5 : SW1-5 data
0 : SW1-5 on
1 : SW1-5 open

Note!

Do not change the setting for any "rsv" bit because it is system reserved.

Setting the alarm-out output state

SW1-1 and SW1-2 can be used to set the alarm-out output state.

Table 5.18. Setting the Alarm-out Output State (SW1-1, SW1-2)

SW1		External alarm output state				
SW1-1	SW1-2	Power off	Power on	WDT WDT start	WDT WDT time-out	
OFF	OFF	OFF	OFF	OFF	ON	*
ON	OFF	OFF	OFF	ON	OFF	
OFF	ON	OFF	ON	ON	OFF	
ON	ON	OFF	ON	OFF	ON	

* Factory Settings

ALARM LED

If you set the PO2M (D7) bit of event output control (013Bh) to 1, the ALARM LED on the front panel of the main unit comes on in either of the following conditions:

- The watchdog timer (WDT) causes a time-out.
- 1 is written to the P2 (D2) bit of the general-purpose I/O port (0138h).

General-purpose Inputs/Outputs and Remote Reset

The BOX-PC has three channels for both of general-purpose insulated inputs and outputs. The inputs can also be used as interrupt or remote reset inputs.

Specifications

[Inputs]

- Input specification : Photocoupler-insulated current driven input
- Input resistance : 4.7kΩ
- Number of input signals : 3 channels (including one which is also available as a remote reset input. Bit 2 fixed)
- Bit available as an interrupt input : Bit 0 (fixed)
- Interrupt level : NMI
- Input protection circuit : Provided with a reverse-connected protection diode
- Input response time : Within 100μsec
- External circuit power supply : 12 to 24VDC (±10%)

[Outputs]

- Output specification : Photocoupler-insulated open collector output
- Output rating : 30VDC Max., 100mA
- Number of output signals : 3 channels (including one which is also available as a watchdog timer alarm output. Bit 2 fixed)
- Output response time : Within 10 μsec

[Common]

- I/O address : 0138h, 013Bh, 013Ch (Capable of being set in 512bytes by the switch)

Usage

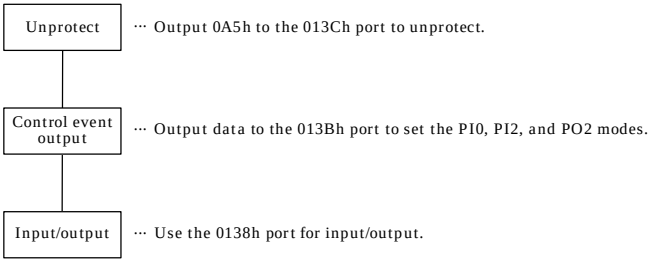

Unprotect
··· Output 0A5h to the 013Ch port to unprotect.
Control event output
··· Output data to the 013Bh port to set the PI0, PI2, and PO2 modes.
Input/output
··· Use the 0138h port for input/output.

Figure 5.14. Using General-purpose Inputs/Outputs and Remote Reset

I/O addresses and instructions

*** 0138h: General-purpose input/output**

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	P2	P1	P0	R/W

Figure 5.15. General-purpose I/O Port (0138h)

R : Input data
- Input bit data = 1 : The input contact is on (conductive).
- Input bit data = 0 : The input contact is off (not conductive).

W : Output data
- Output bit data = 1 : The output transistor is on.
- Output bit data = 0 : The output transistor is off (reset).

*** 013Bh: Event output control**

D7	D6	D5	D4	D3	D2	D1	D0	
PO2M	PI2M	rsv*	PI0M	NMIE	rsv*	WDTM	WDTE	R/W RESET: 10X00X00b

Figure 5.16. Event Output Control Port (013Bh)

NMIE : Enables PI0 NMIs.
- 0 : Enables NMIs by the PI0/NMI(15) signal in the RAS connector.
- 1 : Disables NMIs by the PI0/NMI(15) signal in the RAS connector.

PI0M : PI0/NMI(15) input mode
- 0 : Sets the PI0/NMI(15) signal in the RAS connector to PI0 (general-purpose input).
- 1 : Sets the PI0/NMI(15) signal in the RAS connector to an NMI interrupt input.

PI2M : PI2/RST(14) input mode
- 0 : Sets the PI2/RST(14) signal in the RAS connector to PI2 (general-purpose input).
- 1 : Sets the PI2/RST(14) signal in the RAS connector to a RESET input.

PO2M : PO2/WDT(12) output mode
- 0: Sets the PO2/WDT(12) signal in the RAS connector to PO2 (general-purpose output).
- 1: Sets the PO2/WDT(12) signal in the RAS connector to an alarm-out output.

• If general-purpose output P2 is set in the alarm output mode, the ALARM LED on the front panel of the main unit comes on.

Note!

Do not change the setting for any "rsv" bit because it is system reserved.

*** 013Ch: Port protect control**

D7	D6	D5	D4	D3	D2	D1	D0	
WP7	WP6	WP5	WP4	WP3	WP2	WP1	WP0	W

Figure 5.17. Port Protect Control Port (013Ch)

W : Protects the general-purpose I/O port (0138h).
This port protects and unprotects the general-purpose I/O port. The general-purpose I/O port is protected when the power is turned on and when a reset occurs.
00h : Protect
A5h : Unprotect

External I/O circuits

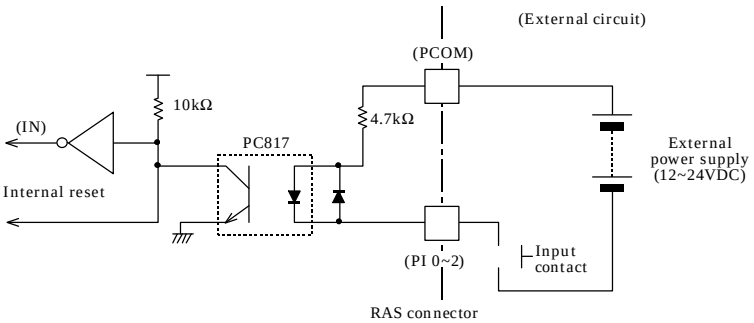


Figure 5.18. Input Circuit

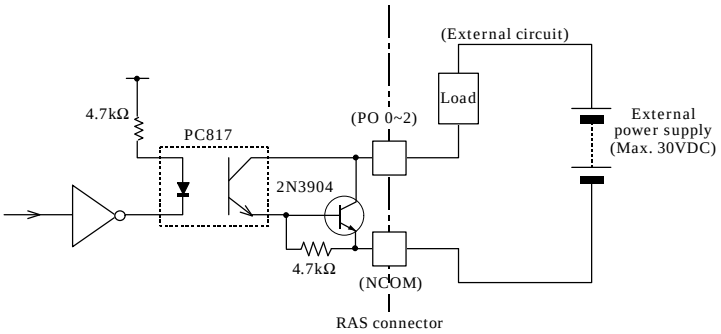


Figure 5.19. Output Circuit

SW1 (General-purpose Switches for the User)

Bits 1 to 4 in SW1 serve as RAS feature setting switches.
Bits 5 and 6 in SW1 serves as general-purpose switches for the user.
This section describes how to use bits 5 and 6.
For bits 1 to 4, see the "RAS Features" and "Watchdog Timer" sections.

I/O Address and data

I/O address: 013Dh

Data can be read in the following format:

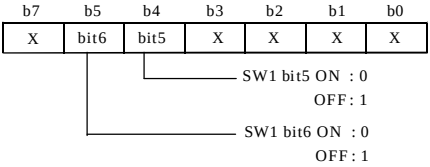


Figure 5.20. Data in General-purpose Switches for the User

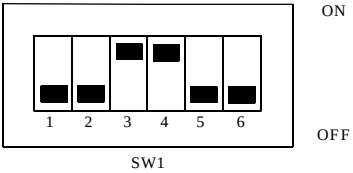


Figure 5.21. SW1 Factory Settings

Reset Switch

The BOX-PC has a hardware reset switch. The switch is hard to press, by design, to prevent it from being pressed accidentally. To press it, therefore, use a pointed object.

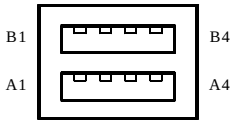
ALARM LED

If the PO2M (D7) bit in the event output control port (013Bh) has been set to 1, the ALARM LED comes on when a WDT time-out occurs or when the P2 bit in the general-purpose I/O port (0138h) is set.

USB Ports

The BOX-PC has two channels of the USB interface.

Table 5.19. USB Connectors



Pin No.	Signal name	Pin No.	Signal name
A1	USB0 Vcc	B1	USB1 Vcc
A2	USB0 -Data	B2	USB1 -Data
A3	USB0 +Data	B3	USB1 +Data
A4	USB0 GND	B4	USB1 GND

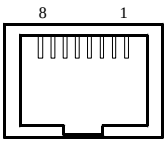
Ethernet (Models E and EP)

Models E and EP have a Fast-Ethernet interface.

- Network type : 100BASE-TX/10BASE_T
- Transmission rate : 100M/10Mbps
- Maximum network path length : 100m/segment
- Controller : 21143 (Intel) or DE21143 (DEC)

* The category-5 cable is required for transmission at 100Mbps.

Table 5.20. Ethernet Connector

Connector type	RJ-45	
		
Pin No.	Signal name	Description
1	TD+	Transmit data (+)
2	TD-	Transmit data (-)
3	RD+	Receive data (+)
4	N.C.	Not connected
5	N.C.	Not connected
6	RD-	Receive data (+)
7	N.C.	Not connected
8	N.C.	Not connected

Network status display LEDs

LINK : Normal connection

FDX : Full-duplex mode

100M : Connection at 100Mbps

LCD Interface

The BOX-PC has an LCD connector for connection to a CONTEC LCD (liquid crystal display). The table below lists the displays that can be connected to the BOX-PC.

The BOX-PC requires an optional connection cable (IPC-P4CL-2H) for connection to the LCD. Set SW2 appropriately depending on the display to be used.

Table 5.21. Supported LCD List

Display	Model	Resolution	SW2
12.1-inch STN desktop	IPC-DS/L400(PC)	SVGA (800 x 600)	4
12.1-inch STN desktop with touch panel	IPC-DS/L400(PC)T		
12.1-inch panel mount	IPC-DS/L30S(PC)T		
12.1-inch TFT desktop	IPC-DT/L400(PC)		0 *
12.1-inch TFT desktop with touch panel	IPC-DT/L400(PC)T		
12.1-inch TFT panel mount with touch panel	IPC-DT/L30S(PC)T		
10.4-inch TFT panel mount with touch panel	IPC-DT/M30(PC)T	VGA (640 x 480)	2
CRT alone			A

* Factory setting

- Although the CRT display (plugged to the VGA connector) can be used along with the LCD at the same time, the display area of the CRT follows that of the LCD. When you use the CRT alone, set SW2 to "A".
- When you use the CRT alone, set SW2 to "A".

Touch-panel serial interface

For an LCD with a touch panel, the BOX-PC has a serial port (SERIAL3) for communication with the touch panel. The I/O address range and IRQ or the "unused" status can be set by BIOS Setup (described in Chapter 4). (Note that the I/O address range or IRQ assigned to any other device cannot be assigned.)

When installing touch panel driver software (option), specify the values saved by BIOS Setup.

Option Touch Panel driver soft (Windows 98/95/NT 4.0) :
IPC-TPB2-DRV

Table 5.22. I/O Addresses and IRT for SERIAL3

COM	I/O address range	IRQ
1	3F8h-3FFh	IRQ3
2	2F8h-2FFh	IRQ4
3	3E8h-3EFh	IRQ5
4	2E8h-2EFh	IRQ10
ORG1	130h-137h	IRQ11
		IRQ15

* I/O addresses 1E0h-1E8h cannot be used.
Set these addresses during BIOS setup.

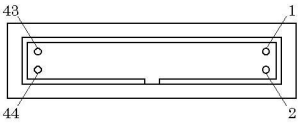
IDE Interfaces

Internal drive connector (primary IDE connector)

The BOX-PC has an E-IDE controller, allowing the on-board connector CN1 to accept a 2.5inch IDE hard disk.

Table 5.23. Primary IDE Connector (CN1)

Connector used	44pin header type (2mm pitch)



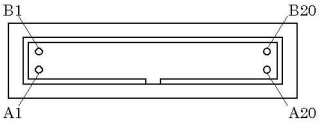
Pin No.	Signal name	Direction	Pin No.	Signal name	Direction
1	RESET-	Output	2	GND	-------
3	DD7	Input/output	4	DD8	Input/output
5	DD6	Input/output	6	DD9	Input/output
7	DD5	Input/output	8	DD10	Input/output
9	DD4	Input/output	10	DD11	Input/output
11	DD3	Input/output	12	DD12	Input/output
13	DD2	Input/output	14	DD13	Input/output
15	DD1	Input/output	16	DD14	Input/output
17	DD0	Input/output	18	DD15	Input/output
19	GND	-------	20	N.C.	-------
21	DDRQ	Input	22	GND	-------
23	DIOW-	Output	24	GND	-------
25	DIOR-	Output	26	GND	-------
27	IOCHRDY	Input	28	DALE	Output
29	DDACK-	Output	30	GND	-------
31	INTRQ	Input	32	N.C.	-------
33	DA1	Output	34	N.C.	Output
35	DA0	Output	36	DA2	Output
37	CSI-	Output	38	CS3-	-------
39	DACT-	Output	40	GND	-------
41	+5V	-------	42	+5V	-------
43	GND	-------	44	N.C.	

Spare IDE connector (Secondary IDE connector CN2)

This connector allows you to temporarily connect an additional device such as a CD-ROM drive when installing software. Prepare the required cable and drive power supply. Note that the top cover cannot be closed when this connector is being used.

Table 5.24. Secondary IDE Connector (CN2)

Connector used	40pin header type (2.54mm pitch)



Pin No.	Signal name	Direction	Pin No.	Signal name	Direction
A1	RESET-	Output	B1	GND	-------
A2	DD7	Input/output	B2	DD8	Input/output
A3	DD6	Input/output	B3	DD9	Input/output
A4	DD5	Input/output	B4	DD10	Input/output
A5	DD4	Input/output	B5	DD11	Input/output
A6	DD3	Input/output	B6	DD12	Input/output
A7	DD2	Input/output	B7	DD13	Input/output
A8	DD1	Input/output	B8	DD14	Input/output
A9	DD0	Input/output	B9	DD15	Input/output
A10	GND	-------	B10	N.C.	-------
A11	DDRQ	Input	B11	GND	-------
A12	DIOW-	Output	B12	GND	-------
A13	DIOR-	Output	B13	GND	-------
A14	IOCHRDY	Input	B14	DALE	Output
A15	DDACK-	Output	B15	GND	-------
A16	INTRQ	Input	B16	N.C.	-------
A17	DA1	Output	B17	N.C.	-------
A18	DA0	Output	B18	DA2	Output
A19	CSI-	Output	B19	CS3-	Output
A20	DACT-	Output	B20	GND	-------

Expansion Slots (Model EP and CP)

The BOX-PC has two PCI/ISA slots which can accept both PCI and ISA boards.

Acceptable board dimensions

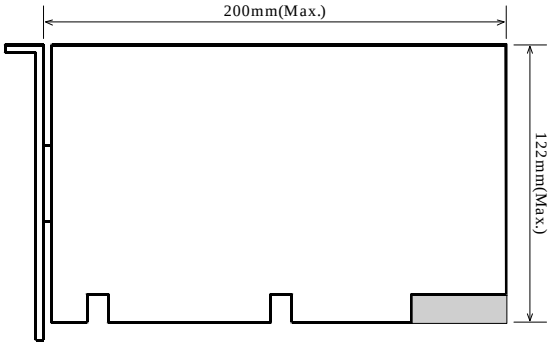


Figure 5.22. Dimensions of Expansion Board

Note!

Some boards which use the end (hatched portion) of the board edge connector may not be installed.

Expansion slot power supply

The table below lists the total voltage and current capacities that can be used by the boards in the expansion slots.

Table 5.25. Expansion Slots

Voltage	Current capacity (Max.)
+5V	2A
+12V	0.5A
-12V	0.13A
-5V	Not supplied

Note!

Be careful not to let the total current consumption by the boards plugged in the expansion slots exceed the above current capacity.

Board installation procedure

(1) Make sure that the power supply is off.

(2) Remove the expansion slot cover.

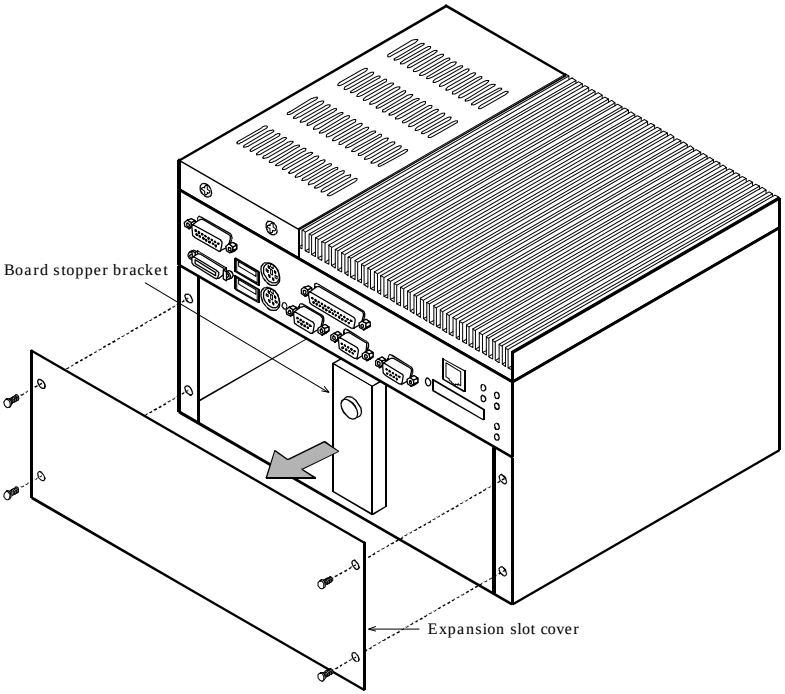


Figure 5.23. Removing the Expansion Slot Cover

(3) Remove the board stopper bracket.
Removing the screw on top releases the bracket toward you.

(4) Insert the board in a slot and fasten it by tightening the screw.

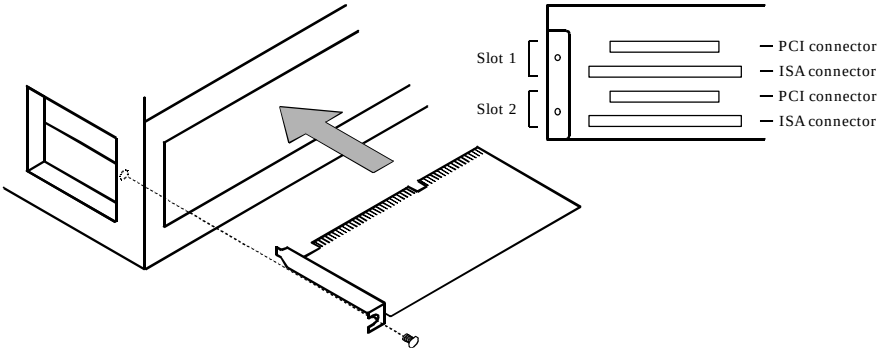


Figure 5.24. Installing an Expansion Board

Note!

Each expansion slot accepts either a PCI or ISA board. Insert the PCI and ISA boards into the PCI and ISA connectors, respectively. Make sure that the board has been fit into the connector.

(5) Attach the board stopper bracket. A board whose height is 110mm or more can be held by the bracket.

(6) Attach the expansion slot cover back in place.

6. Appendix

Memory Map

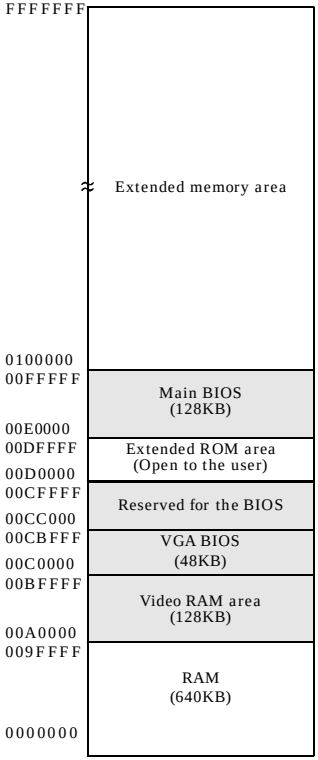


Figure 6.1. Memory Map

I/O Port Addresses

Table 6.1. I/O Port Addresses

ADDRESS(HEX)	Content	Remarks
000-00F	DMA controller 1 (Slave)	Channels 0-3 (8bit transfer)
010-01F	System-reserved	
020-03F	Interrupt controller 1 (Master)	
040-05F	Timer	
060-06F	Keyboard controller	
070-07F	RTC, NMI mask	
080-09F	DMA page register	
0A0-0BF	Interrupt controller 2 (Slave)	
0C0-0DF	DMA controller 2 (Master)	Channels 5-7 (16bit transfer)
0E0-0FF	System-reserved	
100-12F	User-definable	Available to expansion bus (Model EP and CP)
130-137	Serial port 3/4	Touch panel, RS-485
138	General-purpose I/O	RAS features
139-13D	Watchdog timer	RAS features
13C-13F	System-reserved	
140-16F	User-definable	Available to expansion bus (Model EP and CP)
170-17F	IDE hard disk controller	Secondary
180-18F	System-reserved	
190-1DF	User-definable	Available to expansion bus (Model EP and CP)
1E0-1E7	Serial port 4	RS-485
1E8-1EF	System-reserved	
1F0-1FF	IDE hard disk controller	Primary
200-277	User-definable	Available to expansion bus (Model EP and CP)
278-27F	Parallel port	LPT2
280-2E7	User-definable	Available to expansion bus (Model EP and CP)
2E8-2EF	Serial port	COM4
2F0-2F7	User-definable	Available to expansion bus (Model EP and CP)
2F8-2EF	Serial port	COM2
300-35F	User-definable	Available to expansion bus (Model EP and CP)
360-36F	LAN controller	Model E and DP
370-375	System-reserved	
376-377	IDE hard disk controller	Secondary
378-3AF	Parallel port	LPT1
3B0-3BB	System-reserved	
3BC-3BF	Parallel port	LPT3
3C0-3DF	System-reserved	
3E0-3E7	PCMCIA	Model C and CP
3E8-3EF	Serial port	COM3
3F0-3F7	FD controller	
3F8-3FF	Serial port	COM1
4D0-4DF	System-reserved	
CF0-CFF	System-reserved	
46E8	System-reserved	
83D0-B3D3	System-reserved	

Interrupt Levels

Table 6.2. Hardware Interrupt Levels (Factory Settings)

Type	8259	Priority	Content	Vector	Remarks
NMI		Top	-I/O CH CK or WDT	02H	
IRQ0	MASTER	↑	Timer 0	08H	
IRQ1	"	|	Keyboard	09H	
IRQ2	"	|	Interrupt controller 2 (Slave)	0AH	
IRQ8	SLAVE	|	Real-time clock	70H	
IRQ9	"	|	Unused	71H	User-definable
IRQ10	"	|	Serial port 3	72H	
IRQ11	"	|	Serial port 4	73H	
IRQ12	"	|	Reserved for PS-2 mouse	74H	
IRQ13	"	|	Reserved for coprocessor	75H	
IRQ14	"	|	Reserved for HDD	76H	Primary
IRQ15	"	|	Reserved for HDD	77H	Secondary
IRQ3	MASTER	|	Serial port 2 (COM2)	0BH	
IRQ4	"	|	Serial port 1 (COM1)	0CH	
IRQ5	"	|	Parallel port (LP2)	0DH	
IRQ6	"	↓	Reserved for FDD	0EH	
IRQ7	"	Bottom	Parallel port 1 (LPT1, LP3)	0FH	

A-46-056
LZJ2611
021030 [990817]

CONTEC Group

JAPAN : Headquarters
CONTEC Co., LTD.
3-9-31, Himesato, Nishiyodogawa-ku, Osaka 555-0025, Japan
Tel : +81 (6) 6477-5219 Fax : +81 (6) 6477-1692
E-mail : intsales@osaka.contec.co.jp

U.S.A. : CONTEC MICROELECTRONICS U.S.A. INC.
744 South Hillview Drive, Milpitas, CA 95035 U.S.A.
Tel : +1 (408) 719-8200 Fax : +1 (408) 719-6750
E-mail : tech_support@contecusa.com

EUROPE : CONTEC MICROELECTRONICS EUROPE B.V.
Binnenweg 4, 2132 CT, Hoofddorp, The Netherlands
Tel : +31 (23) 567-3030 Fax : +31 (23) 567-3035
E-mail : tech_support@conteceu.nl

KOREA : HYOJIN CONTEC Co., LTD.
Ki-im Bldg. #399, Shindolim-Dong, Kuro-ku, Seoul, Korea
Tel : +82 (2) 2636-4277/8 Fax : +82 (2) 2636-4279
E-mail : product@conteck.com

CHINA : INTERNATIONAL CONTEC TECHNOLOGY CO., LTD.
B-8F, Hua Tong Building, No. B19, Che Gong Zhuang West Road,
Hai Dian District, Beijing 100044, China
Tel : +86(10)8801-8228 Fax : +86 (10)8801-8209
E-mail : ict@ict.com.cn

SHANGHAI CONTEC MICROELECTRONICS CORP.
No. 481 Gui Ping Road, Cao He Jing Hi-Tech Park Shanghai, 200233, China
Tel : +86 (21) 6485-1907 Fax : +86 (21) 6485-0330
E-mail : contec@contec.com.cn

SHENYANG CONTEC MICROELECTRONICS Co., LTD.
No. 169, Qingnian Street, Shenhe District, Shenyang 110015, China
Tel : +86 (24) 2392-9771 Fax : +86 (24) 2392-9773

TAIWAN : MACROMATE CORP.
8F, Universal Center, No.179, Ta-Tung Rd., Sec.1 Hsi-Chih, Taipei Hsien, Taiwan, R.O.C
Tel : +886 (2) 2647-9353 Fax : +886 (2) 2647-9373
E-mail : intl@macromate.com.tw